Technical Paper 356

DEPARTMENT OF COMMERCE

HERBERT HOOVER, SECRETARY

BUREAU OF MINES

SCOTT TURNER, DIRECTOR

ANALYSES OF TENNESSEE COALS

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PREFACE

One of the important functions of the Bureau of Mines has been the analyzing of samples of coal from every coal-mining State and from Alaska. The analyses are being published for the information of Government officials and the public.

These samples have been collected in mines by representatives of the Bureau of Mines and by geologists of the United States Geological Survey in investigations of mineral resources; they have been collected from coal delivered for the use of Government Departments—Treasury, Navy, and War—and for various Government institutions; they have also come from coal obtained for tests by the bureau in investigating the utilization of fuel and the explosibility of coal dust. Many samples have been collected and analyzed in connection with the work of various State geological surveys.

From time to time the bureau has published the analytical results in large bulletins. Although the analyses in any one bulletin are grouped together by States, or by special uses, to look up the analyses of coals from any particular section of the country necessitates the perusal of a number of bulletins, some of which are no longer available for free distribution.

Moreover, when the bureau receives an inquiry for analyses of coal from any desired part of the country, to send a number of bulletins in order to show the analyses for only one mining district in a State or even for an individual mine causes a waste of public documents. It is therefore deemed expedient to republish the analyses of coal in a series of inexpensive publications, by separate States, or, if the coal production of one or more adjacent States is small, by a group of States. These publications include a brief description, abstracted from the reports of the United States Geological Survey, of the geologic structure of the coal basins in the State, or group of States, and of the typical mining conditions in the different districts.

Technical Paper 269 on Iowa coals was the first of the series to be issued; this paper on Tennessee coals is the ninth. The other reports published or in course of publication deal with the coals of Kentucky, Ohio, Utah, Pennsylvania, Alabama, Virginia, and Missouri. The analyses of Pennsylvania coals have been published in a bulletin of the Topographic and Geological Survey of Pennsylvania. From time to time the various papers will be revised to include later analyses.

SCOTT TURNER,
Director.

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ANALYSES OF TENNESSEE COALS

TOPOGRAPHY AND GEOLOGY OF THE COAL FIELDS

By WILBUR A. NELSON[1]

SURFACE FEATURES

The Tennessee coal fields embrace two distinct physiographic areas, one known as the northeastern field and the other as the main Cumberland Plateau field. The coal beds in these two areas are distinct and different. (See fig. 1.)

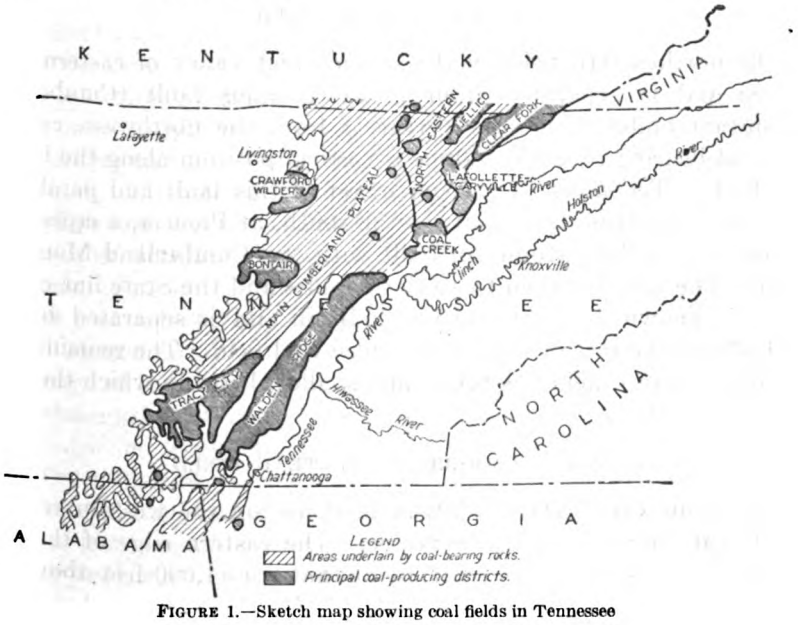

FIGURE 1.—Sketch map showing coal fields in Tennessee

The surface of the northeastern field is an intricate maze of sharp-crested ridges, separated by deep, narrow V-shaped valleys that have been cut by the many streams. The highest ridges have elevations of 3,000 to 3,500 feet above sea level.

[1] State geologist of Tennessee.

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The main Cumberland Plateau field is topographically in great contrast to the northeastern field. It is a broad upland, standing about 2,000 feet above sea level, with a nearly flat or slightly rolling surface that has been cut into by streams flowing to the north, east, west, and south. These streams have cut many deep ravines, which, however, occupy only a small proportion of the total area of the upland. As a result of this partial dissection of the plateau, the coals have been exposed at a large number of points, but remain covered under wide areas, so that the proportion of the beds remaining in many places is almost as large as though the beds were entirely below drainage.

In the northeastern field the coal railroads follow the narrow winding valleys, but in the main Cumberland Plateau field they cross the plateau and generally follow the gently rolling divides between the creeks that flow irregularly across its top.

GEOLOGIC STRUCTURE

NORTHEASTERN FIELD

The northeastern field overlooks the great valley of eastern Tennessee and is separated from it by a major fault (Cumberland Mountain fault) that was overthrust from the northwest, causing the coal-bearing rocks to assume a vertical position along the line of the fault. Ten miles to the northwest of this fault and parallel to it is the Pine Mountain fault; to the south, at Pioneer, a cross fault connects this Pine Mountain fault with the Cumberland Mountain fault. The area between these three faults and the State line on the north is known as the Clear Creek Basin and is separated by the faults from the rest of the northeastern coal field. The remainder of the northeastern field is a broad and shallow basin in which the beds have gentle dips.

MAIN CUMBERLAND PLATEAU FIELD

The main Cumberland Plateau field lies on the western edge of the Great Valley of east Tennessee. The eastern edge of the coal field forms a bold regular escarpment that rises 1,000 feet above the valley and forms its western boundary. On the western edge of the coal field is a similar drop, but the edge of the escarpment is not regular. The Sequatchie Valley, which extends nearly half way across the State in a general direction of N. 30° E., bisects the coal field. This long anticlinal valley ends in the Crab Orchard Mountains, which rise nearly 2,000 feet above the valley, and its sides are formed by the steeply upturned strata of the coal measures, which quickly flatten out in either direction from the escarpment.

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GEOLOGIC FORMATIONS

The coal-bearing rocks of the Tennessee fields are of Pennsylvanian age, but as the two areas have not been mapped in detail and systematically examined, the coals can not be correlated with certainty.

In Cumberland Plateau coal field are the following mining districts: Tracy City, Bon Air, Crawford-Wilder, and Walden Ridge, in which are included the mining districts of Soddy and Rockwood. Campbell[2] applies the name Lee formation to all the coal measures in the main Cumberland Plateau field that lie in and below the Rockcastle conglomerate. The coal measures of the Tracy City, Bon Air, and Wilder districts all belong to the Lee formation. The most prominent member of this formation is the Sewanee conglomerate,[3] which is a massive 100-foot conglomeratic sandstone that stands out prominently throughout the entire field. In the Walden Ridge district the coal measures are made up of the Lee formation, excepting a small area at Spring City and Rockwood, where the overlying Briceville formation[4] caps the high points.

The workable coals of this field are all in the Lee formation. In the Tracy City district they are the Sewanee coal and the Battle Creek coal. In the Bon Air district the workable beds in downward order are as follows: Clifty, Ravencroft, Bon Air No. 2, and Bon Air No. 1. In the Crawford-Wilder district the workable beds are the Isoline and Wilder. In the Walden Ridge district the workable coal beds in downward order are as follows: Morgan Springs, Soddy, Richland, Angel, Nelson, and Goodrich. Except the Morgan Springs coal, which has not been found over 24 inches thick, all of these beds are mined commercially at some place on Walden Ridge. The range of thickness of the other beds mined is 3 to 6 feet.

In the northeastern coal field are the following mining districts: Jellico district, Lafollette-Caryville district, Clearfork district, and Coal Creek district.

In the northeastern coal field, Keith,[5] working on the Briceville folio, applied the following formational names, which have been used in downward order throughout this field: Anderson sandstone, Scott shale, Wartburg sandstone, Briceville shale, and Lee formation.

Glenn,[6] working in this area, has used the following names for the coal beds, in downward order, and has attempted some correlations: Frozenhead, Sharp, Big Mary, Cannel, Twin Seam, Jellico, Blue

[2] Campbell, M. R., Standingstone folio: U. S. Geol. Survey Folio 53, 1899.
[3] Safford, J. M., Report on water supply of Sewanee: Tennessee State Board of Health Bull., vol. 8, 1893.
[4] Nelson, Wilbur A., Tennessee coal field south of the Tennessee Central R. R.: Resources of Tennessee, vol. 6, No. 3, 1916.
[5] Keith, Arthur, Briceville folio: U. S. Geol. Survey Folio 33, 1896.
[6] Glenn, L. C., Resources of Tennessee: Vol. 6, No. 3, 1916.

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Gem, and Coal Creek. The chief beds in this section are the Coal Creek, 3½ to 6 feet thick, which is mined extensively for steam coal, and the Jellico, which is noted as a source of domestic coal. The other beds which lie higher up the mountain sides will be worked more in the future as the lower beds are exhausted.

The coals of the Tracy City district have always been noted for their coking qualities. Sewanee coal comes from this district. The coals of the Bon Air and Crawford-Wilder districts make excellent domestic and steaming fuel. The coals of the Walden Ridge district are suited for both coking and fuel.

The greater part of the coal mined in Tennessee comes from the northeastern field.

Table 1 gives the coal production of Tennessee during the 5 years ended with 1923.[7]

TABLE 1.—*Coal production of Tennessee, 1919–1923*

	1919	1920	1921	1922	1923
Producing counties	16	16	16	----------	----------
Production:					
Loaded at mines for shipment, tons	4,744,543	6,055,946	4,194,364	4,546,552	----------
Sold to local trade and used by employees, tons	128,420	136,623	88,199	111,977	----------
Used at mines for steam and heat, tons	146,631	159,461	123,730	113,854	----------
Made into coke at mines, tons	193,611	310,398	54,033	104,391	----------
Total production, tons	5,213,205	6,662,428	4,460,326	4,876,774	*6,100,000
Average value per ton	$2.77	$4.02	$3.35	$2.89	----------
Employees:					
Underground	8,976	9,227	8,561	----------	----------
Surface	2,547	2,126	1,786	----------	----------
Total employees	11,523	11,353	10,347	9,533	----------
Average days worked yearly	201	234	154	163	----------

* Estimated.

[7] Tryon, F. G., and Hale, S. A., Coal in 1919, 1920, and 1921: Mineral Resources of the United States, 1921, Pt. II, U. S. Geological Survey, 1923, pp. 642-643.

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MINING METHODS

By J. W. Paul[8]

The coal mines in Tennessee with few exceptions have drift openings that follow the coal beds, which outcrop above water drainage. In many places the coal lies several hundred feet above the level of the neighboring valley. Mining methods in the several districts are much alike. One predominating characteristic in several of the districts is the use of wide or double rooms with two tracks, one along each coal pillar, and in some mines the rooms may have two entrances or necks.

The general plan of development is the double entry with rooms and pillars, but many mines use the single-entry plan and single room. In recent years the panel plan has been adopted to some extent and has increased the recovery. The average extraction of coal is 75.3 per cent; 13.2 per cent of the loss is avoidable.[9]

The details of the several districts have been abstracted from data submitted by J. J. Forbes, mining engineer of the Bureau of Mines, to the United States Coal Commission, and from the published reports of the mining department of Tennessee.

NORTHEASTERN FIELD

JELLICO DISTRICT

The great majority of the mines are opened by drifts and developed by the double-entry room-and-pillar system; in most mines the rooms are driven square against the cleats of the coal. Some application of the panel method has been made but its use is exceptional. Little effort is made to extract the entry and room pillars, the recovery in first mining being about 56 per cent; where pillars are "robbed" the recovery averages about 75 per cent. In many mines the coal is undercut by machines and is shot down with black blasting powder or permissible explosives, but in some mines the coal is shot off the solid.

[8] Chief coal-mining engineer, Bureau of Mines.

[9] Amount and nature of losses in mining bituminous coal in the Eastern United States: Report of Bureau of Mines to U. S. Coal Commission, 1923.

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LAFOLLETTE-CARYVILLE DISTRICT

The methods in the Lafollette-Caryville district are similar to those used in the Jellico district but the panel method is nowhere employed. The recovery in first mining and robbing of room pillars is about 55 per cent.

CLEAR FORK DISTRICT

In the early development of the mines in the Clear Fork district the room-and-pillar plan was used but it is being supplanted by the panel method with a decided gain in the recovery. In some mines the recovery now reaches 85 to 90 per cent. Coal is shot off the solid in some of the mines; in others it is undercut. Both black blasting powder and permissible explosives are used in solid shooting and where the coal is undercut.

COAL CREEK DISTRICT

Near their outcrop the coal measures dip somewhat and the mine openings are either slopes or drifts that follow the coal. Most of the mines use the double-entry room-and-pillar method, but a few use the panel method. Both hand-pick and machine mining are practiced; hand mining is facilitated by well-defined soft streaks in the coal. As in other districts, the coal in some mines is shot off the solid with black blasting powder and in some a permissible explosive is used.

MAIN CUMBERLAND PLATEAU FIELD

CRAWFORD-WILDER DISTRICT

The double-entry room-and-pillar method predominates in the Crawford-Wilder district, and the ultimate recovery of coal is about 81 per cent where the room pillars are robbed. Black blasting powder and permissible explosives are used both for shooting off the solid and where the coal is undercut by machines. Haulage underground is mostly by mules.

BON AIR DISTRICT

The mines in the Bon Air district have drift openings and encounter surface water. The general plan of development is the double-entry room-and-pillar. Mining machines are used in some of the mines, and all coal is blasted with black blasting powder. Where the coal is not undercut it is shot off the solid. The haulage is mostly by mules, supplemented in some mines by rope haulage.

TRACY CITY DISTRICT

Many of the mines in the Tracy City district are small producers and the mining method most used is the single-entry and room; in a few mines the double-entry room-and-pillar method is used. Most

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of the mines encounter surface water which requires attention to drainage. Underground haulage is chiefly by mules.

Except at a few mines where coal-cutting machines are used or where the coal is soft and undercut by hand, the coal is shot off the solid with black blasting powder. In the mines which liberate explosive gas fans are used for ventilation, the air currents in some mines being conducted in splits.

WALDEN RIDGE DISTRICT

The mines in the Walden Ridge district are in three localities, Rockwood, Graysville, and Soddy.

The methods of mining throughout the district are similar; the double-entry room-and-pillar is extensively used in the larger mines and the single-entry system with rooms is used in a number of the older mines. In some mines the coal is partly mined by pick before being blasted; in others mining machines are employed, and black blasting powder and permissible explosives are used for shooting coal off the solid and where undercut by machines. Underground haulage is chiefly by animals but some mechanical haulage is employed. Ventilation is effected by fans and at a number of mines by furnaces. Many of the mines are wet in some parts, necessitating attention to drainage.

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ANALYSES OF MINE SAMPLES

By A. C. Fieldner,[10] H. M. Cooper,[11] and F. D. Osgood[12]

The analyses in Table 2 are arranged geographically with respect to counties and towns and are grouped as follows:

1. The proximate analysis—moisture, volatile matter, fixed carbon, and ash.
2. The ultimate analysis—sulphur, hydrogen, carbon, nitrogen, oxygen, and ash.
3. The calorific value or heat of combustion.
4. The softening temperature of the ash, when such determinations were made.

Ultimate analyses are given for three conditions, as follows: (1) As received; (2) moisture free; and (3) moisture and ash free. Proximate analyses and heating values are given in two conditions—as received and moisture free.

The as-received condition represents the sample as received at the laboratory; the moisture-free condition represents the composition and heating value of the dry coal. The moisture and ash free condition represents approximately the composition and calorific value of the dry combustible matter.

The analyses are given to the nearest 0.1 per cent and the British thermal units to the nearest 10, although the laboratory determinations are made to the nearest 0.01 per cent and the nearest unit British thermal units.

SOURCES OF INFORMATION

The analyses in Table 2 comprise those taken from previous publications of the Bureau of Mines and many later analyses, made before June 1, 1923, which are here published for the first time. The methods of analysis used are those developed by the Bureau of Mines.[13]

[10] Fieldner, A. C., supervising fuels chemist, Pittsburgh experiment station.
[11] Cooper, H. M., chemist, Pittsburgh experiment station.
[12] Osgood, F. D., assistant chemist, Pittsburgh experiment station.
[13] Stanton, F. M., and Fieldner, A. C., Methods of analyzing coal and coke: Tech. Paper 8, Bureau of Mines, 1913, 42 pp.

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The majority of the analyses credited to Bureau of Mines Bulletin 22 were made under the direction of the United States Geological Survey at the coal-testing plant at St. Louis; they were published in various Geological Survey reports and later incorporated in Bulletin 22. All other analyses were made in the Washington (D. C.) and Pittsburgh (Pa.) laboratories of the bureau and published in Bulletins 22, 85, 123, and 193.

Column 18 of Table 2 refers to the Bureau of Mines bulletin that contains the description of the mine and data on the section of the bed from which the sample was cut. The figures in column 19 refer to that page of this technical paper where the same data may be found for samples whose analyses are now published for the first time.

FUSIBILITY OF ASH

The softening temperature of coal ash from the coals of the United States[14] ranges from 1,900° to 3,100° F. For convenience, the order of fusibility may be expressed by subdividing this range of softening temperature into three groups as follows:

Class I. Refractory ash, softening above 2,600° F.

Class II. Ash of medium fusibility, softening between 2,200° and 2,600° F.

Class III. Easily fusible ash, softening below 2,200° F.

The softening temperature is defined as the temperature at which a cone of the ash, when heated in the test furnace in a slightly reducing atmosphere, has fused down to a spherical lump.

The Bureau of Mines has determined the softening temperature of the ash of a large number of coals in the United States. The ash of the Tennessee coals that were tested gave temperatures over the whole range of fusibility—from easily fusible to refractory.

A detailed study of the figures obtained does not show any marked characteristics of any one coal bed over another with respect to the softening point of the ash. All beds seem to vary considerably within themselves in different places. The Blue Gem, Bon Air, and Swamp Angel beds seem to tend toward the easily fusible ash of Class I, the majority of results ranging from 1,950° to 2,150° F. About 20 per cent of the tests made of Coal Creek coals showed low softening temperatures of ash, especially for coals from Morgan County. The ash of coals from the Sewanee bed in White and Grundy Counties was easily fusible below 2,100° F.

At the other end of the series in the refractory class with softening temperature of ash above 2,600° F. were scattering samples from all of the widely worked beds, noticeably the Poplar Lick bed in Clai-

[14] Selvig, W. A., and Fieldner, A. C., Fusibility of ash from coal of the United States: Bull. 209, Bureau of Mines, 1922, 119 pp.

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borne County, the Soddy bed in Hamilton County, and the Nelson bed in Rhea County, and about 15 per cent of the Sewanee bed.

The ash of most Tennessee coals, however, is the medium fusible Class II, ranging in temperatures from 2,250° to 2,570° F.—for example, the Sewanee, Coal Creek, Jellico, Mingo, Glenn Mary, Big Mary, and the many miscellaneous local beds. The actual observed temperature of all samples on which determinations were made will be found in Table 2, column 17.

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TABLE 2.—*Chemical analyses of mine samples*

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.[c]	Reference	
	Laboratory No.	Kind[a]	Condition[b]	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.[d]	Page in this report[e]
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ANDERSON COUNTY																		
Coal Creek, 1¼ miles southwest of; Fraterville mine, Coal Creek bed (face of 2 room, 14 right entry, new main entry, 5,560 feet north 40° west of mine mouth).	21636	B	1	1.8	37.0	56.5	4.7	1.2	----	----	----	----	0.3	7,861	14,150	2,300	123	----
			2	----	37.6	57.6	4.8	1.2	----	----	----	----	----	8,006	14,410	----	----	----
Same (face of 3 room, 14 right entry, new main entry, 5,700 feet north 38° west of mine mouth).	21637	B	1	2.0	36.1	56.3	5.6	1.0	----	----	----	----	.5	7,778	14,000	2,420	123	----
Same (face of 3 room, 16 left entry, old main entry, 4,900 feet north 71° west of mine mouth).	21638	B	1	1.7	36.3	54.9	7.1	.9	----	----	----	----	.6	7,700	13,860	2,600	123	----
Same (composite of samples 21637 and 21638)	21639	B	1	1.8	36.5	55.4	6.3	1.0	5.5	78.1	1.9	7.2	.6	7,733	13,920	----	123	----
			2	----	37.2	56.3	6.5	1.0	5.4	79.5	2.0	5.6	----	7,872	14,170	----	----	----
			3	----	39.7	60.3	----	1.1	5.8	84.9	2.1	6.1	----	8,411	15,140	----	----	----
1½ miles west of; Smith mine (face of 1 right entry, main entry, 75 feet north of mine mouth).	21627	B	1	3.9	38.4	54.8	2.9	.8	----	----	----	----	2.2	7,856	14,140	2,320	123	----
			2	----	40.0	57.0	3.0	.9	----	----	----	----	----	8,178	14,720	----	----	----
3 miles northwest of; Black Diamond No. 1 mine, Coal Creek bed (25 pillar, 1 right entry, 12 east entry, 10,900 feet south 22° west of mine mouth).	21645	B	1	1.9	36.5	56.0	5.6	1.5	----	----	----	----	.6	7,850	14,130	2,230	123	----
Same (face of 11 room, 7 right entry, 12 east entry, 9,500 feet south of mine mouth).	21646	B	1	1.9	36.6	54.9	6.6	1.8	----	----	----	----	.6	7,750	13,950	2,180	123	----
Same (face of 4 left entry, 10 west entry, 8,200 feet south 40° west of mine mouth).	21647	B	1	1.8	37.3	56.9	4.0	.8	----	----	----	----	.5	7,972	14,350	2,420	123	----
Same (face of 1 airway, 1 left entry, 10 west entry, 8,900 feet south 24° west of mine mouth).	21648	B	1	1.9	36.7	57.4	4.0	1.0	----	----	----	----	.6	7,989	14,380	2,400	123	----
Same (composite of samples 21645 to 21648, inclusive)	21649	B	1	1.8	36.6	56.5	5.1	1.3	5.4	79.0	1.9	7.3	.6	7,889	14,200	----	123	----
			2	----	37.3	57.5	5.2	1.3	5.3	80.4	2.0	5.8	----	8,039	14,470	----	----	----
			3	----	39.3	60.7	----	1.4	5.6	84.8	2.1	6.1	----	8,472	15,250	----	----	----
3 miles north-northwest of; Klondike or No. 5 mine, Coal Creek bed (face of main entry, 7,700 feet north 65° west of mine mouth).	21640	B	1	2.2	36.0	56.3	5.5	.8	----	----	----	----	.7	7,806	14,050	2,390	123	----
Same (face of 30 left entry, 7,500 feet south 39° west of mine mouth)	21641	B	1	1.7	36.4	55.4	6.5	.9	----	----	----	----	.5	7,767	13,980	2,330	123	----
Same (face of 22 left entry, 7,900 feet south 39° west of mine mouth)	21642	B	1	1.7	37.0	55.9	5.4	.8	----	----	----	----	.4	7,872	14,170	2,460	123	----
Same (face of 32 room, 26 left entry, 7,600 feet south 39° west of mine mouth).	21643	B	1	2.0	37.0	55.5	5.5	.7	----	----	----	----	.7	7,850	14,130	2,420	123	----
Same (composite of samples 21640 to 21643, inclusive)	21644	B	1	1.9	36.6	55.8	5.7	.9	5.5	78.8	1.9	7.2	.6	7,828	14,090	----	123	----
			2	----	37.3	56.9	5.8	.9	5.4	80.3	1.9	5.7	----	7,983	14,370	----	----	----
			3	----	39.6	60.4	----	.9	5.7	85.3	2.0	6.1	----	8,472	15,250	----	----	----

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3 miles southwest of; Thistle mine, Coal Creek bed (face of 2 right entry, main face entry, 1,200 feet south 30° west of mouth of Dogwood opening).	21628	B	1	2.5	36.3	56.8	4.4	1.1					1.1	7,867	14,160	2,320	123	
Same (face of 63 room, 5 left entry, 1,980 feet south 72° west of mine mouth).	21629	B	1	2.0	37.9	53.0	7.1	1.8					.8	7,678	13,820	2,230	123	
Same (face of 8 room, 4 left entry, 5 left entry, 2,380 feet south 52° west of mine mouth).	21630	B	1	2.2	37.4	53.6	6.8	1.9					1.0	7,711	13,880	2,210	123	
Same (composite of samples 21628 to 21630, inclusive)	21631	B	1	2.2	37.2	54.5	6.1	1.6	5.4	77.6	1.8	7.5	1.0	7,756	13,960		123	
			2		38.1	55.6	6.3	1.6	5.3	79.4	1.9	5.5		7,928	14,270			
			3		40.6	59.4		1.7	5.6	84.7	2.0	6.0		8,461	15,230			
4½ miles southwest of; Middle Ridge mine, Coal Creek bed (rib on left main entry, 100 feet southwest of opening).	21680	B	1	2.3	37.4	56.1	4.2	.9					.7	7,878	14,180	2,390	123	
			2		38.3	57.4	4.3	.9						8,067	14,520			
5 miles southwest of; Tennessee mine, Coal Creek bed (A pillar, main entry, 2,840 feet 40° west of mine mouth).	21632	B	1	2.7	36.4	55.5	5.4	1.5					1.1	7,733	13,920	2,350	123	
Same (1 room, 625 entry, Minersville side, 4,040 feet south 57° west of mine mouth).	21633	B	1	2.5	35.4	52.6	9.5	1.7					1.2	7,389	13,300	2,460	123	
Same (1 room, 11 right entry, 4,060 feet south 88° west of mine mouth).	21634	B	1	2.0	35.9	51.8	10.3	1.7					.6	7,350	13,230	2,420	123	
Same (composite of samples 21632 to 21634, inclusive)	21635	B	1	2.3	36.0	53.3	8.4	1.6	5.3	75.2	1.8	7.7	1.0	7,511	13,520		123	
			2		36.9	54.5	8.6	1.7	5.1	77.0	1.8	5.8		7,689	13,840			
			3		40.4	59.6		1.8	5.6	84.3	2.0	6.3		8,411	15,140			
5 miles southwest of; Cross Mountain No. 1 mine, Coal Creek bed (on right rib, 26 left entry, outby last breakthrough to the right).	13237	A	1	1.6	35.4	56.4	6.6	0.8	5.1	78.4	1.8	7.3	0.5	7,806	14,050	2,630	85	
			2		35.9	57.4	6.7	.8	5.0	79.6	1.9	6.0		7,928	14,270			
			3		38.5	61.5		.8	5.4	85.3	2.0	6.5		8,494	15,290			
Same, chain pillar on 27 right entry (18 feet outby 12 and last breakthrough).	13238	A	1	1.9	33.0	53.6	11.5	.8	4.8	74.2	1.8	6.9	.7	7,306	13,150	2,390	85	
			2		33.6	54.6	11.8	.8	4.7	75.6	1.8	5.3		7,444	13,400			
			3		38.1	61.9		.9	5.3	85.7	2.0	6.1		8,439	15,190			
Same (face of 3 room, 26 left entry)	13264	A	1	1.7	35.0	53.2	10.1	1.1	5.0	75.3	1.8	6.7	.5	7,478	13,460	2,580	85	
			2		35.6	54.1	10.3	1.1	4.9	76.6	1.8	5.3		7,606	13,690			
			3		39.7	60.3		1.2	5.4	85.4	2.0	6.0		8,483	15,270			
Same (face of 2 room, 26 left entry)	13265	A	1	1.5	35.9	53.4	9.2	1.0	5.1	75.0	1.8	7.9	.5	7,567	13,620	3,010	85	
			2		36.5	54.1	9.4	1.1	5.0	76.2	1.9	6.4		7,678	13,820			
			3		40.2	59.8		1.2	5.7	84.0	2.1	7.0		8,467	15,240			
Same (right rib, 27 right entry, 30 feet from main entry)	13290	A	1	1.9	35.0	54.5	8.6	.8	5.2	76.8	1.8	6.8	.5	7,656	13,780	2,760	85	
			2		35.6	55.7	8.7	.8	5.0	78.3	1.8	5.4		7,800	14,040			
			3		39.0	61.0		.9	5.5	85.8	2.0	5.8		8,550	15,390			
Same (21 room, 18 left entry, 5,300 feet southwest of mine mouth)	32671	B	1	1.9	36.3	57.7	4.1	.9					.3	7,856	14,140	2,480		50
Same (7 room, 28 right entry, 9,800 feet north-northwest of mine mouth).	32672	B	1	1.5	35.9	55.7	6.9	.8					.1	7,656	13,780	2,400		
Same (36 room, 24 right entry, 9,000 feet northwest of opening)	32673	B	1	1.6	36.3	54.9	7.2	1.9					.0	7,628	13,730	2,120		
Same (composite of samples 32671 to 32673, inclusive)	32674	B	1	1.8	35.9	56.1	6.2	1.2	5.4	77.7	1.9	7.6	.1	7,717	13,890			
			2		36.6	57.1	6.3	1.2	5.3	79.1	2.0	6.1		7,850	14,130			
			3		39.1	60.9		1.3	5.6	84.4	2.1	6.6		8,383	15,090			

[a] A, mine sample collected by an engineer of the Bureau of Mines; B, mine sample collected by a geologist of the U. S. Geological Survey or Tennessee Geological Survey.
[b] 1, Sample as received; 2, dried at a temperature of 105° C.; 3, moisture and ash free.
[c] Figures in this column represent temperature at which the cone of coal ash will fuse to a spherical lump when heated in a furnace in a slightly reducing atmosphere.
[d] Figures in column 18 are the Bureau of Mines bulletins in which these analyses were originally published, wherein may be found the mine notes and face sections from which samples were cut.
[e] Column 19 indicates the page number in this technical paper where mine notes and face sections can be found.

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
ANDERSON COUNTY—continued																		
Fort Mountain Station, ½ mile northwest of; No. 3 mine, Big Mary bed (head of main entry, 250 feet inside of mine mouth).	88831	B	1	2.6	37.4	52.0	8.0	2.9	-----	-----	-----	-----	1.6	7,417	13,350	2,510	----	----
Same (head of 1 left entry, 300 feet inside of mine mouth)	88832	B	1	2.6	36.1	51.0	10.3	2.6	-----	-----	-----	-----	1.6	7,206	12,970	2,450	----	----
Same (composite of samples 88831 and 88832)	88833	B	1	2.6	36.5	52.0	8.9	2.8	5.2	73.1	1.7	8.4	1.6	7,311	13,160	-----	----	----
			2	-----	37.5	53.3	9.2	2.9	5.0	75.0	1.7	6.2	-----	7,506	13,510	-----	----	----
			3	-----	41.3	58.7	-----	3.1	5.5	82.6	1.9	6.9	-----	8,261	14,870	-----	----	----
Devonia, ¼ mile west of; Buffalo mine, Big Mary bed (face of main entry, 700 feet west of mine mouth).	77135	B	1	2.7	38.0	50.0	9.3	3.5	-----	-----	-----	-----	1.4	7,256	13,060	2,250	----	50
Same (face of 1 left entry, 700 feet southwest of mine mouth)	77136	B	1	2.1	38.5	52.5	6.9	2.6	-----	-----	-----	-----	1.0	7,528	13,550	2,240	----	----
Same (composite of samples 77135 and 77136)	77137	B	1	2.5	37.1	52.2	8.2	3.1	5.3	74.0	1.7	7.7	1.2	7,372	13,270	-----	----	----
			2	-----	38.0	53.6	8.4	3.2	5.1	75.9	1.8	5.6	-----	7,556	13,600	-----	----	----
			3	-----	41.5	58.5	-----	3.5	5.6	82.8	1.9	6.2	-----	8,250	14,850	-----	----	----
½ mile northeast of; New River mine, Big Mary bed (face of 2 left airway).	88837	B	1	2.6	37.4	53.4	6.6	2.5	-----	-----	-----	-----	1.6	7,506	13,510	2,570	----	----
Same (near head of 1 right entry)	88838	B	1	2.4	37.1	52.7	7.8	2.8	-----	-----	-----	-----	1.4	7,417	13,350	2,570	----	----
Same (face of 1 room, 2 left entry)	88839	B	1	2.4	35.7	53.0	8.9	2.3	-----	-----	-----	-----	1.5	7,356	13,240	2,670	----	----
Same (composite of samples 88837 to 88839, inclusive)	88840	B	1	2.5	36.9	53.0	7.6	2.6	5.2	74.3	1.6	8.7	1.5	7,428	13,370	-----	----	----
			2	-----	37.8	54.4	7.8	2.6	5.1	76.2	1.7	6.6	-----	7,617	13,710	-----	----	----
			3	-----	41.0	59.0	-----	2.8	5.5	82.6	1.8	7.3	-----	8,256	14,860	-----	----	----
Oliver Springs, 1¼ miles north-northeast of; Hall mine, Coal Creek bed (face of main entry, 400 feet east of mine mouth).	21427	B	1	2.1	40.5	53.4	4.0	1.6	-----	-----	-----	-----	.8	7,900	14,220	2,150	123	----
			2	-----	41.3	54.6	4.1	1.6	-----	-----	-----	-----	-----	8,072	14,530	-----	----	----
3 miles north-northeast of; Piedmont mine, Coal Creek bed (face of Moore's place, Pigankle entry, 1,200 feet north of mine mouth).	21451	B	1	2.4	37.2	56.7	3.7	2.0	-----	-----	-----	-----	1.1	7,972	14,350	2,050	123	----
Same (face of 18 room, 6 right entry, 4,000 feet north-northwest, 1,325 feet east-northeast, and 200 feet south-southeast of mine mouth).	21452	B	1	1.7	38.9	56.0	3.4	1.2	-----	-----	-----	-----	.4	8,067	14,520	2,130	123	----
Same (face 1 of left room, 3 right entry, 2,200 feet north-northwest, 800 feet east-northeast, and 45 feet north-northwest of mine mouth).	21453	B	1	1.9	39.1	54.3	4.7	1.8	-----	-----	-----	-----	.6	7,956	14,320	2,230	123	----
Same (composite of samples 21451 to 21453, inclusive)	21455	B	1	2.0	38.4	55.6	4.0	1.8	5.6	79.5	2.1	7.0	.7	7,989	14,380	-----	123	----
			2	-----	39.2	56.8	4.0	1.9	5.5	81.1	2.2	5.3	-----	8,156	14,680	-----	----	----
			3	-----	40.8	59.2	-----	1.9	5.7	84.5	2.3	5.6	-----	8,494	15,290	-----	----	----

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Same (mouth of 5 right entry; 3,000 feet north-northwest of mine mouth).	21454	B	1	1.3	41.7	51.1	5.9	1.6					.4	8,011	14,420	2,000	123	
			2		42.2	51.8	6.0	1.6						8,117	14,610			
5 miles north of; Windrock mine, Windrock (Dean) bed (near head, 16 left entry, 10,500 feet north-northeast of mine mouth).	32688	B	1	3.6	35.6	53.4	7.4	.8					.8	7,304	13,310	2,260		51
Same (near head, 16 right entry, 9,700 feet northeast of mine mouth).	32689	B	1	3.9	36.8	55.9	3.4	.9					2.0	7,689	13,840	2,290		
Same (head, 19 right entry, 11,400 feet northeast of mine mouth)	32690	B	1	4.4	34.9	56.1	4.6	.9					2.4	7,528	13,550	2,310		
Same (head of 18 left entry, 11,000 feet north-northeast of mine mouth).	32691	B	1	2.5	36.7	56.6	4.2	.8					.6	7,678	13,820	2,310		
Same (composite of samples 32688 to 32691, inclusive)	32692	B	1	3.5	36.2	55.3	5.0	.9	5.4	76.5	1.9	10.3	1.4	7,556	13,600			
			2		37.5	57.3	5.2	.9	5.2	79.2	2.0	7.5		7,828	14,090			
			3		39.5	60.5		1.0	5.5	83.5	2.1	7.9		8,256	14,860			
Same (1,300 feet northeast of drift mouth)	2956	A	1	3.3	35.6	54.5	6.6	.9					1.9	7,506	13,510		22	
			2		36.8	56.4	6.8	.9						7,761	13,970			
Petros, 3 miles north of; Fork Mountain mine, Jellico bed (head of main entry, 300 feet west of mine mouth).	32701	B	1	2.7	36.9	55.4	5.0	2.7	5.4	76.6	1.8	8.5	1.2	7,599	13,780	2,440		51
			2		37.9	57.0	5.1	2.7	5.3	78.8	1.9	6.2		7,872	14,170			
			3		40.0	60.0		2.9	5.5	83.0	2.0	6.6		8,294	14,930			
Rosedale, ¾ mile north of; Deermont mine, State bed (face of 2 left entry).	79873	A	1	2.0	34.9	51.9	11.2	3.0					.9	7,222	13,000	2,260		52
Same (face of room off 2 right entry)	79874	A	1	2.7	33.8	45.3	18.2	2.8					1.6	6,494	11,690	2,480		
Same (face of 11 room, 1 right entry)	79875	A	1	2.9	34.6	53.0	9.5	2.0					1.7	7,278	13,100	2,550		
Same (composite of samples 79873 to 79875, inclusive)	79876	A	1	2.4	34.3	50.7	12.6	2.7	5.1	69.8	1.6	8.2	1.4	7,017	12,630			
			2		35.1	52.0	12.9	2.7	5.0	71.5	1.6	6.3		7,189	12,940			
			3		40.3	59.7		3.1	5.7	82.1	1.9	7.2		8,261	14,870			
¼ mile north of; Rosedale mine, State bed (face of 1 right entry)	79865	A	1	2.5	36.4	52.9	8.2	1.8					1.2	7,400	13,320	2,480		52
Same (face of 1 left entry)	79866	A	1	2.3	35.0	52.3	10.4	3.2					1.0	7,194	12,950	2,390		
Same (face of 2 left entry)	79867	A	1	2.2	35.0	51.4	11.4	2.3					1.0	7,172	12,910	2,440		
Same (composite of samples 79865 to 79867, inclusive)	79868	A	1	2.4	35.7	51.9	10.0	2.5	5.3	72.4	1.7	8.1	1.0	7,256	13,060			
			2		36.6	53.1	10.3	2.5	5.1	74.2	1.8	6.1		7,433	13,380			
			3		40.8	59.2		2.8	5.7	82.7	2.0	6.8		8,288	14,920			
1 mile north of; New River mine, Jellico bed (head of main entry, 800 feet southeast of mine mouth).	32703	B	1	3.3	33.2	54.6	8.9	2.4	5.1	73.4	1.7	8.5	1.5	7,250	13,050	2,370		53
			2		34.4	56.4	9.2	2.4	4.8	76.0	1.8	5.8		7,500	13,500			
			3		37.8	62.2		2.7	5.3	83.6	1.9	6.5		8,256	14,860			
2 miles north of; Charleys Branch mine, Jellico bed (head of main entry, 450 feet southeast of mine mouth).	32700	B	1	4.0	34.9	52.7	8.4	2.0	5.2	73.0	1.7	9.7	2.3	7,228	13,010	2,350		53
			2		36.4	54.8	8.8	2.1	5.0	76.0	1.8	6.3		7,528	13,550			
			3		39.9	60.1		2.3	5.4	83.3	2.0	7.0		8,250	14,850			
Stainville; Main Mountain mine, Jellico bed (head of main entry, 400 feet east of mine mouth).	32697	B	1	2.9	35.1	54.1	7.9	2.3	5.2	74.0	1.9	8.7	.8	7,400	13,220	2,320		54
			2		36.1	55.7	8.2	2.3	5.0	76.3	1.9	6.3		7,567	13,620			
			3		39.3	60.7		2.5	5.5	83.1	2.1	6.8		8,239	14,830			
BLEDSOE COUNTY																		
Atpontley, 1 mile north of; Atpontley No. 6 mine, Sewanee bed (face of Lusk entry, 1,000 feet southwest of mine mouth).	22259	B	1	2.9	30.3	59.8	7.0	.8					1.5	7,639	13,750	2,370	123	
Same (face of Smith room, Lusk entry, 1,200 feet west-southwest of mine mouth).	22260	B	1	3.1	28.7	58.8	9.4	1.3					1.7	7,433	13,380	2,440	123	
Same (composite of samples 22259 and 22260)	22261	B	1	3.0	29.8	59.0	8.2	1.0	5.1	76.7	1.4	7.6	1.6	7,533	13,560		123	
			2		30.7	60.8	8.5	1.1	4.9	79.1	1.5	4.9		7,767	13,980			
			3		33.6	66.4		1.2	5.4	86.4	1.6	5.4		8,489	15,280			
Herbert, near; prospect, Sewanee (?) bed (in drift near mouth)	10915	B	1	3.4	31.1	57.7	7.8	.6					1.9	7,483	13,470	2,600	85	
			2		32.2	59.7	8.1	.6						7,750	13,950			
Same (face of new opening)	10916	B	1	5.3	28.8	59.6	6.3	.5					3.7	7,450	13,410	2,600	85	
			2		30.4	63.0	6.6	.5						7,867	14,160			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
BLEDSOE COUNTY—continued																		
Litton, 2 miles northwest of; A. L. Hale mine, Angel bed (at face)	12584	B	1	3.3	27.9	63.2	5.6	1.9					2.2	7,850	14,130	2,160	85	
			2		28.9	65.3	5.8	1.9						8,122	14,620			
4 miles north of; prospect (in main entry, 60 feet from mouth)	10803	B	1	5.0	25.5	61.8	7.7	.6					3.9	7,494	13,490	2,910	85	
			2		26.8	65.1	8.1	.6						7,889	14,200			
Pikeville, 6 miles southwest of; J. W. McFarland prospect, Morgan Springs bed (in drift entry, 50 feet from outcrop)	10731	B	1	2.2	33.8	53.4	10.6	3.5					1.0	7,361	13,250	2,210	85	
			2		34.6	54.5	10.9	3.6						7,522	13,540			
10 miles west of; Vaughn Bros. prospect, Sewanee (?) bed (outcrop)	11049	B	1	4.4	27.2	59.8	8.6	.9					2.8	7,300	13,140	2,720	85	
			2		28.4	62.6	9.0	1.0						7,639	13,750			
Same (another outcrop)	11050	B	1	4.4	26.7	62.3	6.6	.7					2.6	7,433	13,380	2,540	85	
			2		27.9	65.2	6.9	.7						7,772	13,990			
CAMPBELL COUNTY																		
Anthras, ½ mile south of; Anthras mine, Jellico bed (face of 2 left entry, 2 main entry, 2,450 feet south 45° east, and 200 feet north 45° east of mine mouth)	21853	B	1	3.5	36.8	56.6	3.1	.8					1.7	7,828	14,090	2,400	123	
Same (face of 1 left entry, 2 main entry, 2,200 feet south 45° east, and 300 feet north 45° east of mine mouth)	21854	B	1	2.9	36.8	57.1	3.2	.8					1.0	7,867	14,160	2,430	123	
Same (10 pillar, 2 right entry, 1 main entry, 400 feet south 45° east, and 400 feet south 45° west of mine mouth)	21855	B	1	3.3	36.7	57.2	2.8	.9					1.3	7,839	14,110	2,420	123	
Same (composite of samples 21853 to 21855, inclusive)	21856	B	1	3.2	36.8	56.9	3.1	.9	5.6	78.8	2.0	9.6	1.3	7,844	14,120		123	
			2		38.1	58.7	3.2	.9	5.4	81.5	2.1	6.9		8,106	14,590			
			3		39.3	60.7		.9	5.6	84.2	2.1	7.2		8,378	15,080			
Block, 5,000 feet west-southwest of; Pee Wee mine, Red Ash bed (on rib near face of 2 left entry, 350 feet west-southwest of mine mouth)	22025	B	1	3.6	37.9	53.4	5.1	.9					1.3	7,539	13,570	2,970	123	
Same (face of 1 right entry, 300 feet north of mine mouth)	22026	B	1	3.8	38.4	51.9	5.9	1.1					1.5	7,467	13,440	2,940	123	
Same (composite of samples 22025 and 22026)	22027	B	1	3.7	38.0	52.7	5.6	1.0	5.5	75.5	1.8	10.6	1.4	7,506	13,510		123	
			2		39.5	54.7	5.8	1.0	5.3	78.4	1.8	7.7		7,794	14,030			
			3		41.9	58.1		1.1	5.6	83.2	1.9	8.2		8,272	14,890			
1 mile west-southwest of; Monarch mine, Monarch bed (face of 49 room, 2 left entry, 1,700 feet south of mine mouth)	22028	B	1	3.4	39.0	49.2	8.4	2.4					1.4	7,300	13,140	2,200	123	
Same (face of 3 right entry, 1,050 feet northwest of mine mouth)	22029	B	1	4.1	37.0	48.1	10.8	2.4					2.0	7,028	12,650	2,470	123	

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Same (face of 23 room, near face of 2 right entry, 1,050 feet north-northwest of mine mouth).	22030	B	1	4.1	36.2	47.6	12.1	3.7					2.0	6,850	12,330	2,060	123	
Same (neck of 1 left entry, 1 left cross entry, 2,000 feet south-south-east of mine mouth).	22031	B	1	4.4	35.7	47.8	12.1	2.2					2.4	6,850	12,330	2,470	123	
Same (composite of samples 22028 to 22031, inclusive)	22032	B	1	4.0	37.1	48.1	10.8	2.7	5.3	70.3	1.4	9.5	2.0	7,022	12,640		123	
			2		38.6	50.1	11.3	2.8	5.0	73.3	1.5	6.1		7,317	13,170			
			3		43.5	56.5		3.1	5.7	82.6	1.7	6.9		8,244	14,840			
Buckeye; Willsfield's Jellico mine, Jellico bed (on little dip, 1 left heading, 1,000 feet from mine mouth).	88817	B	1	3.2	32.7	55.5	8.6	.9					2.4	7,300	13,140	2,570		
Same (head of big dip entry, 700 feet from mine mouth)	88818	B	1	3.8	33.7	57.1	5.4	.8					2.9	7,483	13,470	2,740		
Same (composite of samples 88817 and 88818)	88819	B	1	3.5	33.6	56.0	6.9	.8	5.3	75.1	1.8	10.1	2.7	7,433	13,380			
			2		34.8	58.0	7.2	.9	5.0	77.9	1.9	7.1		7,706	13,870			
			3		37.5	62.5		.9	5.4	83.9	2.0	7.8		8,300	14,940			
Caryville, 1½ miles southwest of; Bear Wallow mine, Coal Creek bed (face of main entry, 3,000 feet south 85° west of mine mouth).	21673	B	1	2.2	37.2	56.4	4.2	.8					.6	7,900	14,220	2,610	123	
Same (face of 9 left entry, 2,200 feet south 85° west, and 1,000 feet south 5° east of mine mouth).	21674	B	1	2.3	36.7	56.8	4.2	1.1					.7	7,872	14,170	2,570	123	
Same (face of 6 room, 7 right entry, 2,050 feet south 85° west, and 900 feet north 5° west of mine mouth).	21675	B	1	2.3	36.7	56.6	4.4	.9					.7	7,867	14,160	2,530	123	
Same (composite of samples 21673 to 21675, inclusive)	21676	B	1	2.3	36.7	56.8	4.2	.9	5.5	79.2	1.9	8.3	.7	7,883	14,190		123	
			2		37.5	58.2	4.3	.9	5.4	81.1	1.9	6.4		8,067	14,520			
			3		39.2	60.8		1.0	5.6	84.7	2.0	6.7		8,428	15,170			
1½ miles southwest of; Bear Wallow No. 2 mine, Coal Creek bed (head of main entry, 3,000 feet northwest of mine mouth).	32660	B	1	3.0	33.7	56.0	7.3	.8					1.0	7,467	13,440	2,690		54
Same (head of 1 right entry)	32661	B	1	3.2	34.9	54.9	7.0	1.6					1.2	7,500	13,500	2,350		
Same (head of 1 left entry)	32662	B	1	3.7	32.2	57.7	6.4	1.4					1.6	7,483	13,470	2,300		
Same (composite of samples 32660 to 32662, inclusive)	32663	B	1	3.3	33.5	56.4	6.8	1.2	5.0	76.0	1.7	9.3	1.3	7,511	13,520			
			2		34.7	58.2	7.1	1.2	4.8	78.5	1.8	6.6		7,767	13,980			
			3		37.3	62.7		1.3	5.2	84.5	1.9	7.1		8,356	15,040			
1½ miles southwest of; Pee Wee mine, Lower Dean bed (1 room, main haulageway, 150 feet southwest, 100 feet south, 700 feet east, and 450 feet northeast of mine mouth).	21677	B	1	4.0	37.3	55.3	3.4	.6					1.4	7,700	13,860	2,430	123	
Same (face of 4 right entry, 150 feet southwest, 100 feet south, 700 feet southwest of mine mouth).	21678	B	1	3.5	38.4	54.4	3.7	.8					1.0	7,700	13,860	2,240	123	
Same (composite of samples 21677 and 21678)	21679	B	1	3.7	37.5	55.3	3.5	.7	5.5	77.9	1.6	10.8	1.2	7,711	13,880		123	
			2		38.9	57.5	3.6	.7	5.3	80.9	1.7	7.8		8,006	14,410			
			3		40.4	59.6		.8	5.5	83.9	1.7	8.1		8,306	14,950			
1½ miles southwest of; Sun mine, Red Ash bed (face of 30 room, 10 right entry, 2,500 feet north-northwest, 1,400 feet north-northeast, 550 feet east-southeast, and 50 feet south of mine mouth).	21654	B	1	3.3	38.1	50.8	7.8	1.0					1.1	7,344	13,220	2,470	123	
Same (face of 17 right entry, 4,000 feet west and 900 feet north of mine mouth).	21655	B	1	3.8	38.3	52.8	5.1	1.4					1.5	7,533	13,560	2,400	123	
Same (face of 14 left entry, 2,900 feet west, 1,300 feet south, and 100 feet west of mine mouth).	21656	B	1	3.5	39.3	51.4	5.8	1.1					1.1	7,478	13,460	2,570	123	
Same (face of 5 room, 17 left entry, 3,700 feet west and 200 feet south of mine mouth).	21657	B	1	3.4	38.6	52.7	5.3	1.1					1.1	7,489	13,480	2,590	123	
Same (composite of samples 21654 to 21657, inclusive)	21658	B	1	3.5	38.6	51.9	6.0	1.1	5.6	76.0	1.7	9.6	1.2	7,450	13,410		123	
			2		40.0	53.7	6.3	1.2	5.4	78.7	1.8	6.6		7,717	13,890			
			3		42.7	57.3		1.3	5.7	83.9	1.9	7.2		8,233	14,820			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CAMPBELL COUNTY—continued																		
Caryville, 1¾ miles north-northwest of; Red Ash mine, Red Ash bed (face of 1 room, 15 right entry, 1 haulageway, 2,550 feet west of mine mouth).	21668	B	1	3.5	39.3	52.2	5.0	1.2	.....	.....	.....	.....	1.3	7,567	13,620	.....	123	....
Same (face of 9 left entry, 1 haulageway, 3,025 feet west of mine mouth).	21669	B	1	3.4	37.8	50.6	8.2	1.0	.....	.....	.....	.....	1.2	7,289	13,120	2,420	123	....
Same (face of 1 room, 7½ left entry, 2,050 feet west of mine mouth)	21670	B	1	3.7	38.1	53.3	4.9	.9	.....	.....	.....	.....	1.4	7,572	13,630	2,400	123	....
Same (face of 7 room, 4 right entry, 1,250 feet west and 1,400 feet north of mine mouth).	21671	B	1	3.2	39.2	51.9	5.7	1.1	.....	.....	.....	.....	.9	7,528	13,550	2,450	123	....
Same (composite of samples 21668 to 21671, inclusive)	21672	B	1	3.5	38.5	52.2	5.8	1.0	5.6	75.0	1.7	10.9	1.2	7,489	13,480	.....	123	....
			2	.....	39.9	54.0	6.1	1.0	5.4	77.7	1.8	8.0	.....	7,756	13,960	.....	.....	....
			3	.....	42.4	57.6	.....	1.1	5.7	82.7	1.9	8.6	.....	8,256	14,860	.....	.....	....
1½ miles northwest of; Caryville mine, Red Ash bed (face of 6 room, 4 right entry, 1,150 feet west of mine mouth).	21659	B	1	3.6	38.4	53.7	4.3	1.0	.....	.....	.....	.....	1.2	7,606	13,690	2,480	123	....
Same (face of 3 room, 10 left entry, 1,850 feet south 75° west of mine mouth).	21660	B	1	3.4	37.7	51.7	7.2	1.3	.....	.....	.....	.....	1.3	7,356	13,240	2,410	123	....
Same (face of 5 room, 15 left entry, 3,275 feet south 75° west of mine mouth).	21661	B	1	3.5	38.8	52.7	5.0	1.3	.....	.....	.....	.....	1.1	7,600	13,680	2,220	123	....
Same (face of 3 room, 15 right entry, 3,875 feet west of mine mouth)	21662	B	1	3.3	38.8	50.9	7.0	1.1	.....	.....	.....	.....	1.2	7,383	13,290	2,370	123	....
Same (composite of samples 21659 to 21662, inclusive)	21663	B	1	3.4	38.4	52.4	5.8	1.2	5.5	75.4	1.8	10.3	1.2	7,500	13,500	.....	123	....
			2	.....	39.8	54.2	6.0	1.3	5.3	78.0	1.8	7.6	.....	7,761	13,970	.....	.....	....
			3	.....	42.3	57.7	.....	1.3	5.7	83.0	2.0	8.0	.....	8,256	14,860	.....	.....	....
Chaska, 3,600 feet southeast of; Chaska mine, Rich Mountain bed (at pillar main entry, 400 feet east of mine mouth).	21811	B	1	4.3	39.0	53.8	2.9	1.4	.....	.....	.....	.....	1.8	7,689	13,840	.....	123	....
Same (1 room, 1 right entry, 300 feet southeast of mine mouth)	21812	B	1	4.6	37.9	56.3	1.2	.8	.....	.....	.....	.....	1.8	7,794	14,030	.....	123	....
Same (in main entry, on panhandle side, 600 feet southwest of mine mouth).	21813	B	1	4.4	38.4	55.7	1.5	.9	.....	.....	.....	.....	1.7	7,800	14,040	2,220	123	....
Same (composite of samples 21811 to 21813, inclusive)	21814	B	1	4.4	38.4	55.3	1.9	1.0	5.9	78.9	2.0	10.3	1.7	7,744	13,940	.....	123	....
			2	.....	40.2	57.8	2.0	1.1	5.7	82.6	2.1	6.5	.....	8,106	14,590	.....	.....	....
			3	.....	41.0	59.0	.....	1.1	5.8	84.2	2.1	6.8	.....	8,267	14,880	.....	.....	....
Coal Creek, 4 miles north-northwest of; Cambria mine, Coal Creek bed (face of 1 room, 16 left entry, 5,280 feet north 18° west, and 100 feet south 72° west of mine mouth).	21650	B	1	2.1	30.4	58.1	3.4	.9	.....	.....	.....	.....	.6	7,989	14,380	2,350	123	....

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Same (face of 5 room, 17½ right entry, 5,280 feet north 18° west, and 500 feet north 72° east of mine mouth).	21651	B	1	2.2	36.7	56.5	4.6	.8					.7	7,872	14,170	2,500	123	
Same (8 and 9 pillars, 21 left entry, 6,280 feet north 18° west, and 500 feet south 72° west of mine mouth).	21652	B	1	2.0	37.6	56.9	3.5	.8					.5	7,983	14,370	2,350	123	
Same (composite of samples 21650 to 21652, inclusive)	21653	B	1	2.1	36.6	57.5	3.8	.8	5.5	79.7	1.9	8.3	.6	7,961	14,330		123	
			2		37.4	58.7	3.9	.8	5.4	81.4	2.0	6.5		8,133	14,640			
			3		38.9	61.1		.8	5.6	84.8	2.0	6.8		8,467	15,240			
Cotula; Cotula mine, Jellico bed (head of 1 right entry, 800 feet northwest of mine mouth).	32685	B	1	4.0	35.1	56.0	4.9	1.4	5.4	75.3	1.9	11.1	1.5	7,456	13,420	2,380		55
			2		36.5	58.4	5.1	1.4	5.1	78.4	2.0	8.0		7,761	13,970			
			3		38.5	61.5		1.5	5.4	82.6	2.1	8.4		8,178	14,720			
2,000 feet west of; Southern mine, Jordan bed (4 room, A entry, 1,200 feet south 20° west of mine mouth).	21687	B	1	4.4	36.7	54.8	4.1	1.4					1.8	7,489	13,480	2,080	123	
Same (face of 1 room, main entry, 75 feet southwest of mouth of E entry, 1,700 feet south 60° west of mine mouth).	21688	B	1	4.3	37.5	55.4	2.8	1.0					1.8	7,633	13,740	2,340	123	
Same (composite of samples 21687 and 21688)	21689	B	1	4.3	37.1	55.1	3.5	1.2	5.6	76.7	1.8	11.2	1.8	7,589	13,660		123	
			2		38.8	57.5	3.7	1.2	5.4	80.2	1.9	7.6		7,928	14,270			
			3		40.3	59.7		1.3	5.6	83.2	2.0	7.9		8,233	14,820			
1 mile south of; Wynn mine, Rich Mountain bed (face of 36 room, 2 left entry, 250 feet west, 4,000 feet south, and 50 feet west of mine mouth).	21690	B	1	4.0	38.9	55.1	2.0	.8					1.7	7,778	14,000	2,440	123	
Same (face of 5 right entry, 1,000 feet west, 1,300 feet south, 400 feet west, and 250 feet north of mine mouth).	21691	B	1	3.8	39.2	54.7	2.3	.9					1.7	7,767	13,980	2,450	123	
Same (face of main entry, 1,000 feet west, 1,300 feet south, and 650 feet west of mine mouth).	21692	B	1	3.8	38.8	55.6	1.8	.8					1.6	7,794	14,030	2,460	123	
Same (composite of samples 21690 to 21692, inclusive)	21693	B	1	4.0	38.8	55.1	2.1	.9	5.8	78.5	2.0	10.7	1.7	7,778	14,000		123	
			2		40.4	57.4	2.2	.9	5.5	81.7	2.0	7.7		8,100	14,580			
			3		41.3	58.7		.9	5.7	83.5	2.1	7.8		8,278	14,900			
Elk Valley, ¾ mile north-northwest of; Elkhart mine, Blue Gem bed (face of 2 left entry, 1,200 feet west-southwest of mine mouth).	22015	B	1	4.3	38.3	55.6	1.8	1.1					1.6	7,800	14,040		123	
Same (face of 8 room, 2 left entry, 700 feet west-southwest of mine mouth).	22016	B	1	5.2	37.3	54.9	2.6	1.3					2.3	7,650	13,770	2,000	123	
Same (composite of samples 22015 and 22016)	22017	B	1	4.6	38.0	55.3	2.1	1.2	5.7	77.5	2.0	11.5	1.9	7,706	13,870		123	
			2		39.8	58.0	2.2	1.3	5.5	81.3	2.1	7.6		8,083	14,550			
			3		40.7	59.3		1.3	5.6	83.1	2.2	7.8		8,267	14,880			
1 mile northwest of; Elk Valley mine, Blue Gem bed (face of main entry, 900 feet north of mine mouth).	22018	B	1	4.0	38.4	55.6	2.0	1.0					1.2	7,800	14,040	2,050	123	
Same (face of mud entry, 300 feet north-northeast of mine mouth)	22019	B	1	4.0	39.5	53.9	2.6	1.0					1.5	7,783	14,010	2,080	123	
Same (composite of samples 22018 and 22019)	22020	B	1	3.9	39.1	54.7	2.3	1.0	5.8	78.0	2.1	10.8	1.4	7,772	13,990		123	
			2		40.7	56.9	2.4	1.0	5.6	81.2	2.2	7.6		8,089	14,560			
			3		41.7	58.3		1.0	5.7	83.2	2.2	7.9		8,289	14,920			
1⅛ miles northwest of; Perkins Branch mine, Blue Gem bed (face of 1 right entry, 700 feet west of mine mouth).	22012	B	1	3.5	39.2	55.2	2.1	1.0					1.1	7,856	14,140	1,950	123	
Same (face of 2 right entry, 700 feet west-southwest of mine mouth)	22013	B	1	3.6	39.8	54.7	1.9	1.0					1.0	7,850	14,130	2,130	123	
Same (composite of samples 22012 and 22013)	22014	B	1	3.5	39.7	54.7	2.1	1.0	5.8	78.7	2.0	10.4	1.1	7,878	14,180		123	
			2		41.2	56.7	2.1	1.1	5.6	81.6	2.1	7.5		8,161	14,690			
			3		42.1	57.9		1.1	5.7	83.3	2.1	7.8		8,339	15,010			
3 miles northwest of; Splint mine, Splint bed (face of 1 right entry off old main entry, 800 feet west of mine mouth).	32641	B	1	3.6	37.2	54.7	4.5	1.6					1.4	7,561	13,610	2,270		55
Same (face of 2 right entry off old main entry, 1,000 feet northwest of mine mouth).	32642	B	1	4.5	35.0	48.5	12.0	1.4					2.2	6,783	12,210	2,360		
Same (composite of samples 32641 and 32642)	32643	B	1	4.0	36.1	51.6	8.3	1.5	5.4	73.0	1.7	10.1	1.8	7,189	12,940		123	
			2		37.6	53.8	8.6	1.6	5.1	76.1	1.8	6.8		7,494	13,490			
			3		41.2	58.8		1.7	5.6	83.2	1.9	7.6		8,200	14,760			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CAMPBELL COUNTY—continued																		
Gatliff; Regal mine, Regal Block bed (500 feet south of mine mouth)	2929	A	1	4.3	35.3	56.3	4.1	0.9	----	----	----	----	1.8	7,594	13,670	----	22	----
			2	----	36.9	58.8	4.3	1.0	----	----	----	----	----	7,928	14,270	----	----	----
2½ miles northeast of; Westbourne mine, Log Mountain bed (687 feet northeast of mine mouth).	2931	A	1	3.6	37.3	55.7	3.4	.8	----	----	----	----	1.5	7,850	14,130	----	22	----
			2	----	38.7	57.8	3.5	.9	----	----	----	----	----	8,144	14,660	----	----	----
Habersham, ½ mile north of; Davis Creek mine, Jellico bed (face of 3 right entry, 1,500 feet southeast and 300 feet southwest of mine mouth).	21825	B	1	4.1	37.0	55.1	3.8	1.3	----	----	----	----	2.1	7,639	13,750	----	123	----
			2	----	38.6	57.4	4.0	1.3	----	----	----	----	----	7,967	14,340	----	----	----
½ mile north of; Old Davis Creek mine. Jellico bed (face of 5 left entry, 1,650 feet southeast and 250 feet northeast of mine mouth).	21826	B	1	3.9	36.1	53.4	6.6	1.4	----	----	----	----	2.0	7,406	13,330	2,390	123	----
			2	----	37.5	55.7	6.8	1.5	----	----	----	----	----	7,706	13,870	----	----	----
2 miles southeast of; Remy mine, Rich Mountain bed (face of 12 right entry, 3,100 feet from mine mouth).	21802	B	1	4.4	38.0	55.1	2.5	.7	----	----	----	----	2.2	7,722	13,900	2,740	123	----
Same (face of 13 left entry, 3,400 feet from mine mouth)	21803	B	1	3.8	39.0	54.7	2.5	.7	----	----	----	----	1.6	7,756	13,960	----	123	----
Same (face of 11½ entry, 2,800 feet from mine mouth)	21804	B	1	4.2	38.7	55.5	1.6	.7	----	----	----	----	2.1	7,822	14,080	2,440	123	----
Same (composite of samples 21802 to 21804, inclusive)	21805	B	1	4.1	38.6	55.1	2.2	.7	5.9	77.9	2.0	11.3	2.0	7,767	13,980	----	123	----
			2	----	40.2	57.5	2.3	.8	5.7	81.2	2.1	7.9	----	8,094	14,570	----	----	----
			3	----	41.2	58.8	----	.8	5.8	83.1	2.2	8.1	----	8,289	14,920	----	----	----
1 mile east of; Rich Mountain mine, Rich Mountain bed (face of 7 left entry, 2,150 feet south 30° east, and 800 feet north 60° east of mine mouth).	21806	B	1	3.7	37.9	53.8	4.6	2.2	----	----	----	----	1.6	7,594	13,670	2,160	123	----
Same (face of 4 left entry, 1,200 feet south 30° east, and 1,300 feet north 60° east of mine mouth).	21807	B	1	3.6	38.8	53.9	3.7	1.5	----	----	----	----	1.6	7,650	13,770	----	123	----
Same (face of 8 right entry, 2,450 feet south 30° east, and 400 feet south 60° west of mine mouth).	21808	B	1	3.4	39.2	53.2	4.2	1.7	----	----	----	----	1.2	7,656	13,780	2,330	123	----
Same (face of 9 left entry. 2,650 feet south 30° east, and 200 feet north 60° east of mine mouth).	21809	B	1	3.8	37.9	53.7	4.6	2.1	----	----	----	----	1.5	7,567	13,620	2,210	123	----
Same (composite of samples 21806 to 21809, inclusive)	21810	B	1	3.6	38.7	53.4	4.3	1.9	5.8	76.5	2.0	9.5	1.5	7,628	13,730	----	123	----
			2	----	40.2	55.3	4.5	2.0	5.6	79.4	2.0	6.5	----	7,917	14,250	----	----	----
			3	----	42.0	58.0	----	2.0	5.8	83.1	2.1	7.0	----	8,283	14,910	----	----	----
Jellico, ½ mile east of; Braughton mine, Blue Gem bed (face of main entry, 1,600 feet south-southeast of mine mouth).	21836	B	1	4.4	39.7	53.6	2.3	1.0	----	----	----	----	2.0	7,639	13,750	2,130	123	----
Same (face of last room, main entry, 1,200 feet southeast of mine mouth).	21837	B	1	4.5	38.4	55.3	1.8	.9	----	----	----	----	2.2	7,661	13,790	2,040	123	----
Same (composite of samples 21836 and 21837)	21838	B	1	4.6	38.9	54.4	2.1	1.0	6.0	77.0	2.0	11.9	2.1	7,667	13,800	----	123	----
			2	----	40.8	57.0	2.2	1.0	5.7	80.7	2.1	8.3	----	8,028	14,450	----	----	----
			3	----	41.7	58.3	----	1.0	5.8	82.5	2.1	8.6	----	8,206	14,770	----	----	----

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1 mile south of; Blue Gem mine, Blue Gem bed (face of Pine Mountain, left entry, 160 feet southeast of mine mouth).	21924	B	1	4.9	39.6	53.7	1.8	1.1					2.0	7,617	13,710	1,990	123	
Same (face of Pine Mountain, right entry, 200 feet southwest of mine mouth).	21925	B	1	4.4	39.6	54.1	1.9	1.0					1.4	7,650	13,770	2,130	123	
Same (face of 2 right entry, Crouch Creek entry, 450 feet west of entry mouth).	21926	B	1	4.2	39.8	53.6	2.4	.9					1.3	7,611	13,700	2,140	123	
Same (composite of samples 21924 to 21926, inclusive)	21927	B	1	4.4	39.5	54.1	2.0	1.0	5.8	76.5	2.0	12.7	1.6	7,622	13,720		123	
			2		41.4	56.5	2.1	1.1	5.6	80.0	2.1	9.1		7,972	14,350			
			3		42.3	57.7		1.1	5.7	81.7	2.2	9.3		8,150	14,670			
1½ miles east-southeast of; Black mine, Blue Gem bed (face of main entry, 300 feet north-northeast of mine mouth).	22000	B	1	4.6	38.5	52.9	4.0	1.1					1.7	7,489	13,480	2,070	123	
			2		40.3	55.5	4.2	1.2						7,850	14,130			
1½ miles south of; Evans mine, Blue Gem bed (face of 10 room, 3 left entry, 300 feet south of mine mouth).	22001	B	1	5.5	38.0	54.3	2.2	.8					2.3	7,583	13,650	2,120	123	
Same (face of 7 room, 4 left entry, 600 feet southwest of mine mouth).	22002	B	1	5.1	38.7	54.6	1.6	.9					1.7	7,656	13,780	2,080	123	
Same (composite of samples 22001 and 22002)	22003	B	1	5.2	38.1	54.8	1.9	.8	5.9	76.3	2.1	13.0	2.0	7,628	13,730		123	
			2		40.2	57.8	2.0	.9	5.6	80.5	2.2	8.8		8,044	14,480			
			3		41.0	59.0		.9	5.7	82.2	2.3	8.9		8,211	14,780			
2½ miles west of; Indian Mountain No. 1 mine, Jellico bed (face of 4 left entry, 1 main entry, 900 feet southeast of mouth of mine).	21832	B	1	4.5	37.7	55.7	2.1	.8					2.0	7,739	13,930	2,240	123	
2½ miles west of; Indian Mountain No. 2 mine, Jellico bed (face of 2 left entry, 2 main entry, 700 feet southeast of mouth of mine).	21833	B	1	4.8	36.6	55.3	3.3	1.4					2.3	7,583	13,650	2,270	123	
2½ miles west of; Indian Mountain No. 3 mine, Jellico bed (rib at mouth of short dog entry, 3 main entry, 1,000 feet southwest of mine mouth).	21831	B	1	4.5	36.0	57.0	2.5	1.1					2.2	7,639	13,750	2,100	123	
			2		37.7	59.7	2.6	1.1						8,000	14,400			
2½ miles west of; Indian Mountain No. 5 mine, Jellico bed (face of 4 entry, 5 main entry, 1,200 feet southeast of mine mouth).	21834	B	1	4.8	38.1	53.0	4.1	2.0					2.4	7,500	13,500	2,030	123	
Same (composite of samples 21832 to 21834, inclusive)	21835	B	1	4.7	36.8	55.3	3.2	1.4	5.8	76.4	2.0	11.2	2.2	7,600	13,680		123	
			2		38.6	58.1	3.3	1.4	5.5	80.2	2.1	7.5		7,972	14,350			
			3		40.0	60.0		1.5	5.7	82.9	2.2	7.7		8,244	14,840			
3 miles south of; Jameson Blue Gem mine, Blue Gem bed (rib, 150 feet north of mouth of 10 main entry).	21998	B	1	4.6	39.2	53.9	2.3	1.2					1.3	7,589	13,660		123	
			2		41.1	56.5	2.4	1.3						7,956	14,320	2,060		
Same (face of 13 main entry, 650 feet south of mine mouth)	21999	B	1	5.2	37.8	54.6	2.4	.9					1.9	7,550	13,590		123	
			2		39.9	57.6	2.5	1.0						7,967	14,340			
Kilsyth, 1 mile north of; Big Creek mine, Kent bed (head of main entry, 700 feet west of mine mouth).	32667	B	1	4.9	36.8	56.0	2.3	.9					2.0	7,622	13,720	2,460		
Same (head of first left entry, 600 feet southwest of mine mouth)	32668	B	1	5.5	35.8	55.4	3.3	1.1					2.7	7,450	13,410	2,910		
Same (head first, right entry, 700 feet northwest of mine mouth)	32669	B	1	5.0	35.6	56.3	3.1	.8					2.1	7,550	13,590	2,620		
Same (composite of samples 32667 to 32669, inclusive)	32670	B	1	5.1	36.3	55.8	2.8	1.0	5.6	76.5	1.9	12.2	2.3	7,539	13,570			
			2		38.3	58.7	3.0	1.0	5.3	80.6	2.0	8.1		7,944	14,300			
			3		39.4	60.6		1.1	5.4	83.0	2.0	8.5		8,183	14,730			
2 miles northeast of; Gem No. 2 mine, Jordan bed (face of 2 room, 7 left entry, 1,450 feet north 23° west, 1,300 feet north 11° west, 180 feet south 39° west, and 150 feet south 11° east of mine mouth).	21696	B	1	4.0	37.5	55.7	2.8	.8					1.6	7,639	13,750	2,360	123	
Same (face of 8 right entry, 1,450 feet north 23° west, 1,850 feet north 11° west, and 150 feet north 39° east of mine mouth).	21697	B	1	4.6	36.3	55.6	3.5	.7					2.0	7,539	13,570	2,040	123	
2 miles northeast of; Gem No. 4 mine, Jordan bed (face of 2 right entry, 600 feet north 11° west, and 550 feet north 39° west of mine mouth).	21694	B	1	4.2	36.3	56.5	3.0	.6					1.8	7,622	13,720	2,420	123	
Same (face of 3 left entry, 1,050 feet north 11° west, and 175 feet south 79° west of mine mouth).	21695	B	1	4.4	36.0	56.6	3.0	.7					2.0	7,578	13,640	2,660	123	
Same (composite of samples 21696, 21697, 21694, and 21695)	21698	B	1	4.3	36.7	55.9	3.1	.7	5.6	77.4	1.9	11.3	1.9	7,594	13,670		123	
			2		38.4	58.4	3.2	.7	5.3	80.9	2.0	7.9		7,939	14,290			
			3		39.7	60.3		.8	5.5	83.6	2.1	8.0		8,206	14,770			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CAMPBELL COUNTY—continued																		
Kimberly, ½ mile east of; Kimberly mine, Rich Mountain bed (face of 10 left entry).	21821	B	1	4.9	39.1	51.9	4.1	2.2	----	----	----	----	2.8	7,517	13,530	2,230	123	----
Same (face of 3 right entry, new main entry)	21822	B	1	4.0	39.7	51.1	5.2	1.5	----	----	----	----	1.8	7,533	13,560	2,480	123	----
Same (face of 2 right entry, new main entry)	21823	B	1	4.1	39.3	52.2	4.4	1.8	----	----	----	----	1.9	7,594	13,670	2,420	123	----
Same (composite of samples 21821 to 21823, inclusive	21824	B	1	4.3	39.7	51.4	4.6	1.8	5.8	74.7	1.9	11.2	2.2	7,556	13,600	----	123	----
			2	----	41.4	53.8	4.8	1.9	5.6	78.1	2.0	7.6	----	7,889	14,200	----	----	----
			3	----	43.5	56.5	----	2.0	5.8	82.0	2.1	8.1	----	8,289	14,920	----	----	----
Lafollette, 1 mile northwest of; Rex No. 2 mine, Rex bed (face of 3 left main entry).	17544	A	1	2.6	35.3	54.3	7.8	1.1	5.2	75.1	1.9	8.9	.3	7,456	13,420	2,450	123	----
			2	----	36.2	55.8	8.0	1.1	5.1	77.0	2.0	6.8	----	7,650	13,770	----	----	----
			3	----	39.4	60.6	----	1.2	5.5	83.8	2.1	7.4	----	8,317	14,970	----	----	----
Same (face of 2 left main entry)	17552	A	1	2.6	37.2	57.1	3.1	1.2	----	----	----	----	.4	7,878	14,180	2,080	123	----
Same (face of 6 right entry, 3 left main entry)	17553	A	1	2.8	36.8	54.6	5.8	1.0	----	----	----	----	.5	7,589	13,660	2,260	123	----
Same (composite of samples 17552 and 17553)	17554	A	1	2.6	36.2	56.7	4.5	1.1	5.4	78.3	1.9	8.8	.5	7,744	13,940	----	123	----
			2	----	37.2	58.2	4.6	1.2	5.3	80.4	2.0	6.5	----	7,956	14,320	----	----	----
			3	----	39.0	61.0	----	1.2	5.5	84.3	2.1	6.9	----	8,339	15,010	----	----	----
Same (cross heading, 4,200 feet northwest of mine mouth)	7498	A	1	3.0	34.0	58.1	4.9	1.8	5.2	75.8	1.6	10.7	1.3	7,700	13,860	----	22	----
			2	----	35.1	59.8	5.1	1.8	5.0	78.1	1.7	8.3	----	7,939	14,290	----	----	----
			3	----	36.9	63.1	----	1.9	5.3	82.3	1.8	8.7	----	8,361	15,050	----	----	----
Same (4,000 feet west, at right cross heading)	7497	A	1	2.9	32.0	58.3	6.8	1.1	5.2	75.0	1.6	10.3	1.5	7,506	13,510	----	22	----
			2	----	33.0	60.0	7.0	1.2	5.0	77.2	1.7	7.9	----	7,733	13,920	----	----	----
			3	----	35.5	64.5	----	1.3	5.4	83.0	1.8	8.5	----	8,317	14,970	----	----	----
2 miles northeast of; Rex No. 1 mine, Rex bed (face of 1 main entry)	17555	A	1	2.9	36.9	57.1	3.1	.8	----	----	----	----	.6	7,867	14,160	2,230	123	----
Same (face of 18 right entry, 1 right main entry)	17556	A	1	2.8	34.7	55.0	7.5	.9	----	----	----	----	.5	7,450	13,410	2,260	123	----
Same (face of 15 right entry)	17557	A	1	2.8	33.0	50.6	13.6	.9	----	----	----	----	.6	6,889	12,400	2,220	123	----
Same (composite of samples 17555 to 17557, inclusive)	17558	A	1	2.8	35.1	54.0	8.1	.9	5.1	74.1	2.0	9.8	.6	7,406	13,330	----	123	----
			2	----	36.0	55.7	8.3	.9	4.9	76.2	2.0	7.7	----	7,617	13,710	----	----	----
			3	----	39.2	60.8	----	1.0	5.3	83.2	2.2	8.3	----	8,306	14,950	----	----	----
Same (face of 1 left entry, 4,500 feet north 37° west, 1,325 feet north 24° east, and 800 feet north 60° west of mine mouth).	21699	B	1	3.2	37.5	56.3	3.0	1.1	----	----	----	----	1.3	7,789	14,020	2,120	123	----
Same (face of main entry, 4,500 feet north 37° west, and 2,550 feet north 66° west of mine mouth).	21700	B	1	3.0	37.8	55.8	3.4	.8	----	----	----	----	1.0	7,822	14,080	2,210	123	----

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Same (face of 2 right entry, 2,400 feet north 37° west, 2,125 feet north 53° east, 1,875 feet north 24° east, and 1,775 feet south 66° east of mine mouth).	21701	B	1	3.3	37.1	55.9	3.7	1.5					1.1	7,683	13,830	2,160	123	
Same (face of 2 left main entry, 2,400 feet north 37° west, 2,125 feet north 53° east, 1,875 feet north 24° east, and 2,900 feet north 66° west of mine mouth).	21702	B	1	3.2	37.5	56.6	2.7	.9					1.1	7,833	14,100	2,210	123	
Same (composite of samples 21699 to 21702, inclusive)	21703	B	1	3.1	37.4	56.3	3.2	1.0	5.6	78.6	2.0	9.6	1.1	7,783	14,010		123	
			2		38.6	58.1	3.3	1.1	5.4	81.1	2.0	7.1		8,039	14,470			
			3		39.9	60.1		1.1	5.6	83.9	2.1	7.3		8,311	14,960			
Morley; Meadow Branch mine, Jellico bed (near head of 4 left entry, 800 feet west of mine mouth).	32652	B	1	4.5	36.3	54.4	4.8	2.3					1.8	7,428	13,370	2,070		55
Same (head of 3 left entry, 600 feet from mine mouth)	32653	B	1	6.3	35.1	55.3	3.3	1.2					3.6	7,411	13,340	2,160		
Same (head of 4 left entry, 1,000 feet west from mine mouth)	32654	B	1	5.2	35.5	54.2	5.1	2.5					2.3	7,344	13,220	2,080		
Same (composite of samples 32652 to 32654, inclusive)	32655	B	1	5.3	35.6	54.7	4.4	2.0	5.5	74.5	1.9	11.7	2.5	7,378	13,280			
			2		37.6	57.7	4.7	2.2	5.1	78.7	2.0	7.3		7,783	14,010			
			3		39.4	60.6		2.3	5.4	82.5	2.1	7.7		8,167	14,700			
1½ miles southeast of; Red Moon mine, Jellico bed (face of 3 main south entry, 1,900 feet southwest of mine mouth).	21827	B	1	3.4	38.2	54.0	4.4	1.8					1.5	7,678	13,820	2,160	123	
Same (face of 3 main north entry, 1,800 feet southwest of mine mouth).	21828	B	1	4.3	37.3	52.8	5.6	2.5					2.5	7,500	13,500	2,280	123	
Same (face of 1 right entry, 1,950 feet southwest of mine mouth)	21829	B	1	3.3	38.3	53.7	4.7	1.2					1.4	7,656	13,780	2,450	123	
Same (composite of samples 21827 to 21829, inclusive)	21830	B	1	3.6	37.9	53.6	4.9	1.8	5.7	76.1	1.9	9.6	1.8	7,594	13,670		123	
			2		39.3	55.7	5.0	1.9	5.5	78.9	2.0	6.7		7,878	14,180			
			3		41.4	58.6		2.0	5.7	83.1	2.1	7.1		8,300	14,940			
Newcomb; Regina Slope mine, Swamp Angel bed (head of main entry, 1,200 feet west of mine mouth).	32644	B	1	5.0	36.7	52.1	6.2	2.0					2.5	7,294	13,130	1,990		55
Same (head of 2 right entry, 1,700 feet northwest of mine mouth)	32645	B	1	5.0	36.1	50.7	8.2	2.7					2.8	7,067	12,720	1,990		
Same (head of 1 right entry, 1,000 feet northwest of mine mouth)	32646	B	1	7.2	35.4	51.8	5.6	1.8					4.6	7,128	12,830	1,990		
Same (composite of samples 32644 to 32646, inclusive)	32647	B	1	5.7	35.9	51.7	6.7	2.2	5.5	72.2	1.7	11.7	3.3	7,161	12,890			
			2		38.1	54.8	7.1	2.3	5.1	76.5	1.8	7.2		7,594	13,670			
			3		41.0	59.0		2.5	5.5	82.3	1.9	7.8		8,167	14,700			
1½ miles north of; Washington Blue Gem mine, Blue Gem bed (face of 6 breakthrough, main tunnel entry, 700 feet west-southwest of mine mouth).	21931	B	1	4.8	37.0	56.5	1.7	.9					2.5	7,706	13,870	1,970	123	
Same (face of 1 left entry, 800 feet west-southwest of mine mouth)	21932	B	1	4.2	38.3	55.8	1.7	.8					1.8	7,739	13,930	1,990	123	
Same (composite of samples 21931 and 21932)	21933	B	1	4.5	37.8	56.0	1.7	.8	5.8	78.5	2.1	11.1	2.1	7,722	13,900		123	
			2		39.6	58.7	1.7	.8	5.6	82.2	2.2	7.5		8,089	14,560			
			3		40.3	59.7		.8	5.7	83.6	2.2	7.7		8,233	14,820			
1½ miles northeast of; Old Italian Blue Gem mine, Blue Gem bed (face of Ben Vicar entry, 4 right entry, 875 feet east-southeast, 190 feet south-southwest, and 150 feet west-northwest of mine mouth).	21928	B	1	5.1	37.7	54.1	3.1	.9					2.0	7,428	13,370	2,130	123	
Same (face of 3 left entry, old main entry, 775 feet east-northeast and 800 feet north-northeast of mine mouth).	21929	B	1	5.7	36.8	55.8	1.7	1.0					2.1	7,506	13,510	2,090	123	
Same (composite of samples 21928 and 21929)	21930	B	1	5.4	37.5	54.7	2.4	.9	5.8	75.2	2.0	13.7	2.0	7,467	13,440		123	
			2		39.6	57.9	2.5	.9	5.5	79.5	2.1	9.5		7,894	14,210			
			3		40.6	59.4		1.0	5.6	81.6	2.2	9.6		8,100	14,580			
1½ miles west of; Brummitt mine, Blue Gem bed (rib of main entry, 100 feet west of mine mouth).	21996	B	1	5.1	37.0	56.2	1.7	.8					1.8	7,644	13,760		123	
			2		39.0	59.2	1.8	.9						8,056	14,500			
2 miles west of; Jellico cannel mine (rib on main entry, opposite 3 left entry, 300 feet north-northeast, and 720 feet west-northwest of mine mouth).	21997	B	1	1.5	45.1	34.1	19.3	1.2					.5	6,856	12,340		123	
			2		45.7	34.7	19.6	1.2						6,961	12,530			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CAMPBELL COUNTY—continued																		
Newcomb, 2½ miles west of; Zechini mine, Jellico bed (face of Vaughn entry, 500 feet north 20° west of mine mouth).	22008	B	1	4.2	37.3	52.9	5.6	0.9	----	----	----	----	1.7	7,439	13,390	2,960	123	----
Same (face of main east entry, 400 feet north 65° west of mine mouth).	22009	B	1	4.5	37.9	53.8	3.8	.8	----	----	----	----	2.1	7,589	13,660	2,910	123	----
Same (face of main west entry, 500 feet north 55° west of mine mouth).	22010	B	1	5.0	36.4	53.3	5.3	.8	----	----	----	----	2.5	7,417	13,350	2,790	123	----
Same (composite of samples 22008 to 22010, inclusive)	22011	B	1	4.6	36.8	53.7	4.9	.8	5.6	75.6	1.8	11.3	2.1	7,494	13,490	----	123	----
			2	----	38.6	56.3	5.1	.9	5.3	79.2	1.9	7.6	----	7,850	14,130	----	----	----
			3	----	40.7	59.3	----	.9	5.6	83.5	2.0	8.0	----	8,272	14,890	----	----	----
3 miles north-northwest of; Marion-Anna mine, Jellico bed (face of 1 right entry, 3,000 feet west of mine mouth).	22004	B	1	3.1	37.6	53.0	6.3	2.2	----	----	----	----	1.0	7,456	13,420	2,220	123	----
Same (pillar, T right entry, 3,200 feet west-northwest of mine mouth).	22005	B	1	3.2	37.4	53.4	6.0	1.7	----	----	----	----	.9	7,461	13,430	2,440	123	----
Same (pillar, 3 main entry, 3,400 feet west-northwest of mine mouth).	22006	B	1	3.0	38.1	53.5	5.4	1.5	----	----	----	----	1.0	7,533	13,560	2,270	123	----
Same (composite of samples 22004 to 22006, inclusive)	22007	B	1	3.2	37.6	53.3	5.9	1.9	5.5	75.3	2.0	9.4	1.0	7,489	13,480	----	123	----
			2	----	38.8	55.1	6.1	1.9	5.3	77.8	2.0	6.9	----	7,739	13,930	----	----	----
			3	----	41.3	58.7	----	2.0	5.7	82.8	2.2	7.3	----	8,239	14,830	----	----	----
Nick's Creek; Nick's Creek mine, Joyner bed (head of main entry, 400 feet from mine mouth).	88828	B	1	2.6	38.0	53.9	5.5	4.3	----	----	----	----	1.6	7,589	13,660	2,340	----	----
Same (neck of 2 left room, main entry, 200 feet from mine mouth).	88829	B	1	3.8	37.7	53.0	5.5	4.2	----	----	----	----	2.7	7,528	13,550	2,340	----	----
Same (composite of samples 88828 and 88829)	88830	B	1	3.2	37.9	53.5	5.4	4.2	5.5	74.7	1.8	8.4	2.1	7,556	13,600	----	----	----
			2	----	39.1	55.3	5.6	4.3	5.3	77.1	1.8	5.9	----	7,800	14,040	----	----	----
			3	----	41.4	58.6	----	4.6	5.6	81.6	1.9	6.3	----	8,261	14,870	----	----	----
Oswego, ½ mile northwest of; Powhatan mine, Blue Gem bed (face of 10 entry, 3,100 feet northwest of mine mouth).	21871	B	1	4.4	37.7	55.8	2.1	.8	----	----	----	----	1.5	7,667	13,800	2,040	123	----
Same (face of 10 room, 9 entry, 2,700 feet north-northwest of mine mouth).	21872	B	1	4.3	38.7	55.3	1.7	.9	----	----	----	----	1.4	7,706	13,870	1,960	123	----
Same (composite of samples 21871 and 21872)	21873	B	1	4.4	38.0	55.7	1.9	.9	5.8	77.7	2.1	11.6	1.5	7,711	13,880	----	123	----
			2	----	39.7	58.3	2.0	.9	5.5	81.2	2.2	8.2	----	8,067	14,520	----	----	----
			3	----	40.5	59.5	----	.9	5.7	82.9	2.3	8.2	----	8,233	14,820	----	----	----

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2½ miles northwest of; Falls Branch mine, Jellico bed (mouth of 1 room, 49½ entry, 2,500 feet northeast, 550 feet northwest, and 350 feet northeast of mine mouth).	21839	B	1	4.3	38.2	55.5	2.0	1.0					2.1	7,739	13,930	2,390	123	
			2		39.9	58.0	2.1	1.0						8,083	14,550			
Same (face of 1 room, 39 right entry, 2,500 feet northeast, 375 feet southeast, 125 feet northeast, and 100 feet southeast of mine mouth).	21840	B	1	3.8	38.4	55.7	2.1	.9					1.8	7,761	13,970	2,270	123	
Same (face of 59 entry, 1,000 feet northeast, 1,200 feet northwest, and 800 feet northeast of mine mouth).	21841	B	1	3.7	38.5	54.5	3.3	1.3					1.9	7,661	13,790		123	
Same (face of 58 entry, 1,000 feet northeast, 1,550 feet northwest, and 900 feet northeast of mine mouth).	21842	B	1	3.8	37.8	54.8	3.6	1.2					2.0	7,639	13,750		123	
Same (composite of samples 21840 to 21842, inclusive)	21843	B	1	3.9	38.0	55.2	2.9	1.1	5.8	77.2	2.0	11.0	1.9	7,689	13,840		123	
			2		39.6	57.4	3.0	1.1	5.5	80.3	2.1	8.0		7,994	14,390			
			3		40.8	59.2		1.2	5.7	82.9	2.1	8.2		8,250	14,850			
Pioneer; Pioneer mine, Pioneer bed (head of 5 right entry, 500 feet west-northwest of mine mouth).	32664	B	1	3.2	36.5	51.9	8.4	3.1					1.0	7,283	13,110	2,010		56
Same (head of main entry, 500 feet west of mine mouth)	32665	B	1	3.2	37.9	52.4	6.5	1.9					1.2	7,483	13,470	2,420		
Same (composite of samples 32664 and 32665)	32666	B	1	3.1	36.9	52.4	7.6	2.4	5.3	73.5	1.8	9.4	1.0	7,350	13,230			
			2		38.1	54.0	7.9	2.5	5.1	75.9	1.9	6.7		7,589	13,660			
			3		41.4	58.6		2.7	5.5	82.4	2.0	7.4		8,233	14,820			
2 miles northwest of; Pioneer Jellico mine, bed undetermined (head of main entry, 600 feet from mine mouth).	32686	B	1	5.2	34.7	50.4	9.7	1.0	5.3	70.3	1.5	12.2	2.9	6,956	12,520	2,730		56
			2		36.6	53.1	10.3	1.0	5.0	74.2	1.6	7.9		7,339	13,210			
			3		40.8	59.2		1.2	5.5	82.7	1.8	8.8		8,178	14,720			
Pioneer mine No. 2, Big Mary bed (head of 2 right entry, 600 feet from mine mouth).	88834	B	1	2.4	32.9	50.9	13.8	2.8					1.5	6,894	12,410	2,570		
Same (head of 1 left entry, 500 feet from mine mouth)	88835	B	1	4.9	33.2	49.1	12.8	3.5					4.0	6,733	12,120	2,450		
Same (composite of samples 88834 and 88835)	88836	B	1	3.7	32.9	50.2	13.2	3.1	4.9	68.3	1.5	9.0	2.7	6,806	12,250			
			2		34.2	52.1	13.7	3.3	4.7	70.9	1.5	5.9		7,067	12,720			
			3		39.6	60.4		3.8	5.4	82.2	1.8	6.8		8,189	14,740			
Red Ash (Ky.), ¾ mile south of; Indian Mountain mine, Jellico bed (entry, face heading, 2,500 feet northwest of mine mouth).	81236	A	1	3.6	38.1	55.7	2.6	.8					1.4	7,661	13,790	2,340		57
Same (pillar, 10 left entry, 1,000 feet west of mine mouth)	81237	A	1	4.2	37.6	56.1	2.1	.8					1.9	7,633	13,740	2,340		
Same (rib of crosscut, 14 left entry, 2,000 feet northwest of mine mouth).	81238	A	1	4.2	37.1	55.8	2.9	1.1					1.9	7,589	13,660	2,150		
Same (face of 13 right entry, 1,800 feet northwest of mine mouth)	81239	A	1	4.0	37.5	54.5	4.0	.8					1.8	7,506	13,510	2,390		
Same (composite of samples 81236 to 81239, inclusive)	81240	A	1	4.1	37.2	55.7	3.0	.8	5.7	76.5	1.7	12.3	1.8	7,594	13,670			
			2		38.8	58.1	3.1	.9	5.5	79.8	1.8	8.9		7,917	14,250			
			3		40.1	59.9		.9	5.7	82.4	1.8	9.2		8,172	14,710			
Turley, 1⅛ miles southwest of; Rock Springs mine, Upper Dean bed, (face of 2 main entry, 2,500 feet west-southwest of mine mouth).	22021	B	1	3.2	36.7	48.5	11.6	2.8					1.6	6,989	12,580	2,400	123	
Same (face of 4 right entry, 2,000 feet west of mine mouth)	22022	B	1	3.6	37.0	48.0	11.4	2.9					1.9	7,011	12,620	2,290	123	
Same (face of 8 room, 2 left entry, 1,800 feet southwest of mine mouth)	22023	B	1	3.5	37.1	47.5	11.9	2.9					1.6	6,950	12,510	2,170	123	
Same (composite of samples 22021 to 22023, inclusive)	22024	B	1	3.5	36.6	48.4	11.5	2.8	5.2	69.8	1.3	9.4	1.7	6,994	12,590		123	
			2		37.9	50.1	12.0	2.9	5.0	72.4	1.4	6.3		7,250	13,050			
			3		43.1	56.9		3.3	5.6	82.2	1.5	7.4		8,239	14,830			
Vasper, ½ mile west of; Vasper mine, Coal Creek bed (face of main entry, 1,400 feet southwest of mine mouth).	21665	B	1	2.1	37.1	56.4	4.4	1.5					.6	7,822	14,080	2,170	123	
Same (face of 1 right entry, main entry, 800 feet west and 260 feet north of mine mouth).	21666	B	1	1.7	38.2	56.2	3.9	.9					.3	7,900	14,220	2,320	123	
Same (composite of samples 21665 and 21666)	21667	B	1	2.0	37.7	56.2	4.1	1.2	5.5	79.3	1.9	8.0	.4	7,878	14,180		123	
			2		38.4	57.4	4.2	1.3	5.4	80.9	2.0	6.2		8,033	14,460			
			3		40.1	59.9		1.3	5.6	84.4	2.1	6.6		8,383	15,090			
1½ miles southwest of; Disney mine, Frozen Head (?) bed (rib in main entry, 150 feet south of mine mouth).	21664	B	1	4.7	37.5	54.0	3.8	.7					2.2	7,556	13,600	2,340	123	
			2		39.3	56.7	4.0	.7						7,928	14,270			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CAMPBELL COUNTY—continued																		
Westbourne; Westbourne No. 2 mine, Jellico bed (face of 2 right butt entry, 700 feet inside).	32648	B	1	4.0	36.1	54.1	5.8	1.2	----	----	----	----	2.0	7,383	13,290	1,990	----	57
Same (face of 10 right entry, 20 right butt entry, 800 feet south of mine mouth).	32649	B	1	5.4	34.5	53.3	6.8	1.3	----	----	----	----	3.1	7,206	12,970	2,250	----	----
Same (head of 4 left butt entry, 800 feet from mine mouth)	32650	B	1	6.2	33.4	53.5	6.9	1.7	----	----	----	----	4.0	7,100	12,780	2,380	----	----
Same (composite of samples 32648 to 32650, inclusive)	32651	B	1	5.2	34.2	54.2	6.4	1.4	5.4	73.2	1.8	11.8	3.0	7,228	13,010	----	----	----
			2	----	36.1	57.1	6.8	1.5	5.1	77.2	1.9	7.5	----	7,628	13,730	----	----	----
			3	----	38.7	61.3	----	1.6	5.5	82.8	2.1	8.0	----	8,178	14,720	----	----	----
½ mile east of; White Oak mine, Log Mountain bed (3 left entry, off drainage tunnel, 1,800 feet from mine mouth).	32656	B	1	5.3	35.5	56.3	2.9	.9	----	----	----	----	2.5	7,561	13,610	2,180	----	58
Same (head of 4 left entry, 2,000 feet from mine mouth)	32657	B	1	5.2	36.8	55.9	2.1	1.1	----	----	----	----	2.1	7,589	13,660	2,010	----	----
Same (head of 3 right entry, 1,800 feet from mine mouth)	32658	B	1	7.6	35.7	54.1	2.6	.8	----	----	----	----	3.5	7,289	13,120	2,120	----	----
Same (composite of samples 32656 to 32658, inclusive)	32659	B	1	5.9	36.3	55.1	2.7	1.0	5.5	76.1	1.9	12.8	2.7	7,450	13,410	----	----	----
			2	----	38.6	58.6	2.8	1.0	5.2	80.9	2.0	8.1	----	7,922	14,260	----	----	----
			3	----	39.7	60.3	----	1.0	5.3	83.2	2.1	8.4	----	8,150	14,670	----	----	----
CLAIBORNE COUNTY																		
Anthras, 1½ miles south of; Tachett Creek mine, Jellico bed (head of butt entry, 1,000 feet southwest of mine mouth).	32675	B	1	3.3	37.2	56.1	3.4	1.3	----	----	----	----	1.3	7,761	13,970	2,280	----	59
Same (face of 7 left room, butt entry, 900 feet from mine mouth)	32676	B	1	3.4	37.2	56.6	2.8	.8	----	----	----	----	1.4	7,811	14,060	2,570	----	----
Same (face of 3 right room, butt entry, 800 feet from mine mouth)	32677	B	1	4.3	36.3	56.7	2.7	.8	----	----	----	----	2.2	7,694	13,850	2,620	----	----
Same (composite of samples 32675 to 32677, inclusive)	32678	B	1	3.7	36.5	56.9	2.9	1.0	5.5	78.2	1.9	10.5	1.6	7,767	13,980	----	----	----
			2	----	37.9	59.1	3.0	1.0	5.3	81.2	2.0	7.5	----	8,061	14,510	----	----	----
			3	----	39.1	60.9	----	1.0	5.4	83.7	2.1	7.8	----	8,311	14,960	----	----	----
Bosworth (Ky.), ½ mile southwest of; Yellow Creek No. 3 mine, Billy-goat bed (chain pillar, 2 right entry, 600 feet south 30° east of mine mouth).	22087	B	1	3.9	39.7	53.3	3.1	1.1	----	----	----	----	2.2	7,833	14,100	2,600	123	----
Same (face of 4 right entry, 1,150 feet south 25° east of mine mouth)	22088	B	1	3.4	38.9	54.4	3.3	1.1	----	----	----	----	1.5	7,883	14,190	----	123	----
Same (face of main entry, 1,500 feet south 45° east of mine mouth)	22089	B	1	3.2	40.2	55.1	1.5	1.0	----	----	----	----	1.3	8,056	14,500	----	123	----

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Same (face of 5 left entry, 1,250 feet south 70° east of mine mouth)	22090	B	1	2.9	40.0	54.1	3.0	1.1					1.1	7,944	14,300		123	
Same (composite of samples 22,087 to 22,090, inclusive)	22091	B	1	3.3	39.9	54.0	2.8	1.0	5.9	79.3	2.1	8.9	1.5	7,939	14,290		123	
			2		41.3	58.8	2.9	1.1	5.7	82.0	2.2	6.1		8,217	14,790			
			3		42.5	57.5		1.1	5.9	84.5	2.2	6.3		8,456	15,220			
Bryson; Bryson Mountain No. 1 mine, Mingo bed (16 stump, 3 cross entry, 3,400 feet south 70° west of mine mouth)	22106	B	1	3.4	37.7	54.7	4.2	1.1					1.6	7,683	13,830	2,460	123	
Same (chain pillar, 1 cross entry, 2,600 feet south 45° west of mine mouth)	22107	B	1	3.6	36.7	53.9	5.8	1.6					1.7	7,550	13,590	2,530	123	
Same (chain pillar, 5 cross entry, 3,800 feet south 85° west of mine mouth)	22108	B	1	3.8	37.2	54.7	4.3	1.2					1.7	7,650	13,770	2,490	123	
Same (composite of samples 22106 to 22108, inclusive)	22109	B	1	3.6	37.4	54.2	4.8	1.4	5.7	76.3	1.7	10.1	1.7	7,611	13,700		123	
			2		38.7	56.3	5.0	1.4	5.5	79.1	1.8	7.2		7,894	14,210			
			3		40.8	59.2		1.5	5.7	83.3	1.8	7.7		8,306	14,950			
⅛ mile southwest of; Bryson Mountain No. 2 mine, Poplar Lick bed (rib sample from main entry, 500 feet west of mine mouth)	22105	B	1	3.4	38.6	50.5	7.5	2.6					1.8	7,383	13,290	2,360	123	
			2		39.9	52.3	7.8	2.7						7,644	13,760			
Clairfield; Buffalo Mountain mine, Jellico bed (head of main entry, 810 feet from mine mouth)	88844	B	1	4.1	33.6	53.9	8.4	1.6					3.1	7,250	13,050	2,450		
Same (at entrance of 1 left entry)	88845	B	1	3.3	35.8	55.2	5.7	1.0					2.3	7,544	13,580	2,220		
Same (composite of samples 88844 and 88845)	88846	B	1	3.7	34.5	54.9	6.9	1.3	5.4	74.4	1.8	10.2	2.7	7,400	13,320			
			2		35.8	57.0	7.2	1.4	5.1	77.2	1.9	7.2		7,683	13,830			
			3		38.6	61.4		1.5	5.5	83.2	2.0	7.8		8,278	14,900			
2 miles east of; King Mountain mine, Jellico bed (face of 3 room, 3 left entry, 1 left entry, 1,000 feet south 50° east of mine mouth)	21849	B	1	3.1	36.4	57.9	2.6	.7					1.4	7,883	14,190		123	
Same (face of 1 room, 2 left entry, 1 right main entry, 1,850 feet south 30° west of mine mouth)	21850	B	1	2.9	37.5	53.1	6.5	2.2					1.4	7,567	13,620	2,040	123	
Same (face of 4 room, 1 left entry, 1 left main entry, 700 feet south 25° east of mine mouth)	21851	B	1	3.1	36.9	57.3	2.7	.8					1.4	7,900	14,220	2,460	123	
Same (composite of samples 21849 to 21851, inclusive)	21852	B	1	3.0	37.2	55.9	3.9	1.2	5.6	78.5	1.9	8.9	1.4	7,794	14,030		123	
			2		38.3	57.6	4.1	1.2	5.4	80.9	2.0	6.4		8,033	14,460			
			3		39.9	60.1		1.3	5.6	84.3	2.1	6.7		8,372	15,070			
1 mile east of; Standard mine, Jellico bed (17 room neck, 1 entry, 825 feet north 5° west of mine mouth)	21867	B	1	3.2	37.2	57.1	2.5	.9					1.5	7,911	14,240	2,260	123	
Same (face of 20 room, 3-D entry, 2,100 feet north 15° east of mine mouth)	21868	B	1	3.0	38.9	54.6	3.5	.9					1.2	7,844	14,120	2,110	123	
Same (face of 3-C entry, 1,100 feet north 30° west of mine mouth)	21869	B	1	2.8	36.4	57.2	3.6	1.0					1.0	7,828	14,090		123	
Same (composite of samples 21867 to 21869, inclusive)	21870	B	1	2.9	37.7	56.2	3.2	.9	5.6	79.1	2.0	9.2	1.2	7,867	14,160		123	
			2		38.8	57.9	3.3	.9	5.4	81.5	2.0	6.9		8,106	14,590			
			3		40.2	59.8		1.0	5.6	84.3	2.1	7.0		8,383	15,090			
Eagan, ¾ mile south of; Buffalo mine, Jellico bed (face of 9 main entry, 3,250 feet south of mine mouth)	21862	B	1	3.2	37.5	56.7	2.6	.7					1.4	7,939	14,290	2,570	123	
Same (face of 10 right entry, 2,400 feet south and 1,050 feet west of mine mouth)	21863	B	1	3.0	38.1	54.6	4.3	1.7					1.1	7,772	13,990	2,110	123	
Same (face of 8 right entry, 2,000 feet south and 1,500 feet west of mine mouth)	21864	B	1	2.9	37.9	56.1	3.1	.7					1.1	7,900	14,220	2,440	123	
Same (face of 6 right entry, 1,500 feet south and 1,600 feet west of mine mouth)	21865	B	1	3.4	37.7	55.2	3.7	1.5					1.5	7,778	14,000	2,110	123	
Same (composite of samples 21862 to 21865, inclusive)	21866	B	1	3.1	37.8	55.7	3.4	1.2	5.6	78.5	2.0	9.3	1.3	7,839	14,110		123	
			2		39.1	57.4	3.5	1.2	5.4	81.0	2.1	6.8		8,094	14,570			
			3		40.5	59.5		1.3	5.6	84.0	2.1	7.0		8,389	15,100			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CLAIBORNE COUNTY—continued																		
Fonde (Ky.), near; Clear Fork mine, Mingo bed (3 left entry, 2 face entry, 11,000 feet from mine mouth).	32679	B	1	6.8	30.8	59.6	2.8	0.7	-----	-----	-----	-----	4.7	7,478	13,460	2,730	----	59
Same (face of 1 room, 2 right entry, 2 face entry, 12,000 feet from mine mouth).	32680	B	1	5.4	33.0	57.8	3.8	.7	-----	-----	-----	-----	3.3	7,494	13,490	2,670	----	----
Same (4 right aircourse, 2 face entry, 12,000 feet southeast of mine mouth).	32681	B	1	3.8	35.3	56.1	4.8	.8	-----	-----	-----	-----	1.8	7,561	13,610	2,640	----	----
Same (head of 2 face heading, 10,500 feet southeast of mine mouth)	32682	B	1	6.8	31.4	57.5	4.3	.8	-----	-----	-----	-----	4.9	7,372	13,270	2,620	----	----
Same (composite of samples 32679 to 32682, inclusive)	32683	B	1	5.8	32.3	58.2	3.7	.7	5.5	76.7	1.7	11.7	3.7	7,483	13,470	-----	----	----
			2	-----	34.3	61.7	4.0	.7	5.1	81.4	1.8	7.0	-----	7,944	14,300	-----	----	----
			3	-----	35.7	64.3	-----	.8	5.3	84.8	1.9	7.2	-----	8,272	14,890	-----	----	----
Fork Ridge; No. 2 mine, Mingo bed (4,000 feet northeast of slope)	2907	A	1	3.7	35.6	56.0	4.7	1.3	-----	-----	-----	-----	1.8	7,667	13,800	-----	22	----
			2	-----	37.0	58.1	4.9	1.3	-----	-----	-----	-----	-----	7,967	14,340	-----	----	----
Mingo No. 3 mine, Mingo bed (near head of 4 left entry)	33457	B	1	7.4	31.5	54.0	7.1	.8	-----	-----	-----	-----	5.6	7,017	12,630	2,680	----	59
Same (near head of 2 right entry)	33458	B	1	6.2	33.1	53.1	7.6	1.0	-----	-----	-----	-----	4.1	7,122	12,820	2,440	----	----
Same (composite of samples 33457 and 33458)	33459	B	1	6.7	32.3	53.5	7.5	.8	5.1	71.8	1.9	12.9	4.9	7,033	12,660	-----	----	----
			2	-----	34.6	57.4	8.0	.9	4.7	77.0	2.0	7.4	-----	7,544	13,580	-----	----	----
			3	-----	37.6	62.4	-----	1.0	5.1	83.7	2.2	8.0	-----	8,200	14,760	-----	----	----
Mingo No. 4 mine, Poplar Lick bed (on main entry, 600 feet from mine mouth).	33460	B	1	4.9	35.1	55.5	4.6	1.0	-----	-----	-----	-----	2.6	7,383	13,290	2,910	----	60
			2	-----	36.9	58.3	4.8	1.1	-----	-----	-----	-----	-----	7,767	13,980	-----	----	----
Nicholson No. 2 mine, Jack Rock or Mingo bed (head of 8 right entry, 2,600 feet from mine mouth).	33461	B	1	6.8	31.2	54.6	7.4	.9	-----	-----	-----	-----	4.9	7,022	12,640	2,460	----	60
Same (head of 7 right entry, 2,600 feet from mine mouth)	33462	B	1	4.1	31.3	55.6	9.0	1.0	-----	-----	-----	-----	2.4	7,161	12,890	2,500	----	----
Same (head of 7 left entry, 2,500 feet from mine mouth)	33463	B	1	4.8	32.5	55.0	7.7	1.0	-----	-----	-----	-----	3.1	7,183	12,930	2,500	----	----
Same (composite of samples 33461 to 33463, inclusive)	33464	B	1	5.2	31.7	55.1	8.0	.9	5.0	72.6	1.8	11.7	3.5	7,106	12,790	-----	----	----
			2	-----	33.4	58.1	8.5	1.0	4.7	76.6	1.9	7.3	-----	7,494	13,490	-----	----	----
			3	-----	36.5	63.5	-----	1.1	5.1	83.6	2.1	8.1	-----	8,189	14,740	-----	----	----
¼ mile southwest of; Fork Ridge No. 1 mine, Mingo bed (face of 17 room, 1 right entry, 9,200 feet south 45° east of mine mouth).	22114	B	1	5.2	38.0	54.9	1.9	1.0	-----	-----	-----	-----	2.5	7,650	13,770	2,080	123	----

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Same (face of 11 room, 2 right entry, 8,900 feet south 43° east of mine mouth).	22115	B	1	3.1	37.2	54.6	5.1	1.3					1.3	7,650	13,770	2,440	123	
Same (face of 11 room, 3 left entry, 8,850 feet south 48° east of mine mouth).	22116	B	1	3.2	36.8	52.9	7.1	1.5					1.2	7,478	13,460	2,440	123	
Same (face of 15 room, 4 left entry, 9,300 feet south 52° east of mine mouth).	22117	B	1	3.5	37.2	54.9	4.4	1.0					1.8	7,661	13,790	2,570	123	
Same (composite of samples 22114 to 22117, inclusive)	22118	B	1	3.9	36.6	54.9	4.6	1.2	5.6	76.4	1.9	10.3	1.7	7,606	13,690		123	
			2		38.1	57.1	4.8	1.2	5.4	79.4	1.9	7.3		7,911	14,240			
			3		40.0	60.0		1.3	5.7	83.5	2.0	7.5		8,311	14,960			
1¼ miles southwest of; Fork Ridge No. 4 mine, Poplar Lick bed (face of 1 right entry, 1 face entry, 2,400 feet west, 350 feet north, and 200 feet east of mine mouth).	22110	B	1	3.4	36.7	53.0	6.9	.8					1.5	7,467	13,440	2,690	123	
Same (face of main entry, 2,500 feet due west of mine mouth)	22111	B	1	3.7	37.2	52.7	6.4	.8					1.7	7,461	13,430	2,960	123	
Same (face of 2 cross entry, 2,400 feet west and 600 feet south)	22112	B	1	3.4	37.5	53.3	5.8	.8					1.5	7,544	13,580	2,710	123	
Same (composite of samples 22110 to 22112, inclusive)	22113	B	1	3.5	37.2	52.9	6.4	.8	5.6	75.2	1.9	10.1	1.6	7,472	13,450		123	
			2		38.5	54.8	6.7	.9	5.4	77.9	2.0	7.1		7,744	13,940			
			3		41.3	58.7		.9	5.8	83.5	2.1	7.7		8,294	14,930			
Hartranft, 1,500 feet southeast of; Mingo No. 5 mine, Poplar Lick bed (face of 21 left entry, 3,600 feet south 45° east of mine mouth).	22097	B	1	3.1	36.9	51.0	9.0	2.8					1.2	7,256	13,060	2,380	123	
Same (face of 11 right entry, 3,200 feet south 5° west of mine mouth)	22098	B	1	3.1	38.2	50.2	8.5	2.6					1.1	7,311	13,160	2,440	123	
Same (face of 19 right entry, 3,700 feet south 10° east of mine mouth)	22126	B	1	3.0	37.1	49.7	10.2	3.0					1.1	7,139	12,850	2,300	123	
Same (composite of samples 22097, 22098, and 22126)	22099	B	1	2.9	37.7	50.1	9.3	2.7	5.5	72.7	1.7	8.1	1.1	7,250	13,050		123	
			2		38.8	51.6	9.6	2.8	5.4	74.8	1.8	5.6		7,461	13,430			
			3		42.9	57.1		3.1	5.9	82.7	1.9	6.4		8,250	14,850			
Reliance No. 2 mine, Mingo bed (barrier pillar, main aircourse, 2,700 feet south 40° west of mine mouth).	22120	B	1	3.5	37.9	55.3	3.3	.9					1.5	7,806	14,050	2,080	123	
Same (30 pillar, 27 right entry, 1,950 feet south 25° west of mine mouth).	22121	B	1	3.9	37.3	55.2	3.6	1.2					1.9	7,728	13,910	2,400	123	
Reliance No. 1 mine, (new side track, 2 left entry, 500 feet north 65° west of mine mouth).	22122	B	1	3.7	37.2	54.5	4.6	1.4					1.9	7,700	13,860	2,470	123	
Same (1 room, 3 left entry, 750 feet north 70° west of mine mouth)	22123	B	1	3.5	37.9	55.4	3.2	1.1					1.7	7,833	14,100	2,460	123	
Same (composite of samples 22120 to 22123, inclusive)	22124	B	1	3.6	37.3	55.5	3.6	1.1	5.7	78.3	1.7	9.6	1.7	7,767	13,980		123	
			2		38.7	57.5	3.8	1.1	5.5	81.2	1.8	6.6		8,056	14,500			
			3		40.2	59.8		1.2	5.7	84.4	1.8	6.9		8,372	15,070			
Sandstone Parting mine, Sandstone Parting bed (near face of 1 left entry, 500 feet south 85° west of mine mouth).	22119	B	1	5.0	34.0	51.2	9.8	1.2					3.1	7,078	12,740	2,380	123	
			2		35.8	53.9	10.3	1.3						7,450	13,410			
Manring, ½ mile west-southwest of; Sterling mine, Poplar Lick bed (face of 6 left entry, 2 face entry, 6,400 feet west and 2,000 feet north of mine mouth).	22100	B	1	3.3	36.2	52.3	8.2	.9					1.1	7,333	13,200	2,960	123	
Same (face of 2 entry, 4 right entry, 2 face entry, 5,500 feet west and 2,900 feet north of mine mouth).	22101	B	1	3.4	34.5	53.1	9.0	1.0					1.1	7,233	13,020	3,010	123	
Same (face of 1 room, 2 right entry, 2 face entry, 4,500 feet west and 2,800 feet north of mine mouth).	22102	B	1	3.4	33.9	51.0	11.7	.9					1.2	6,967	12,540	2,910	123	
Same (face of 1 room, 3 left entry, 2 face entry, 5,600 feet west and 1,400 feet north of mine mouth).	22103	B	1	3.5	36.5	52.0	8.0	1.0					1.5	7,317	13,170	2,850	123	
Same (composite of samples 22100 to 22103, inclusive)	22104	B	1	3.4	35.5	51.9	9.2	1.0	5.6	72.5	1.9	9.8	1.2	7,217	12,990		123	
			2		36.7	53.7	9.6	1.0	5.4	75.1	1.9	7.0		7,472	13,450			
			3		40.6	59.4		1.1	6.0	83.0	2.1	7.8		8,261	14,870			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CLAIBORNE COUNTY—continued																		
Pruden, ½ mile south of; High Cliff mine, Mingo bed (face of main entry, 3,300 feet south 45° east of mine mouth).	21857	B	1	3.3	37.8	54.3	4.6	1.2	----	----	----	----	1.5	7,689	13,840	2,590	123	----
Same (face of 5 room, 8 right entry, 2,900 feet south 45° east, and 300 feet south 45° west of mine mouth).	21858	B	1	3.3	38.3	55.7	2.7	1.1	----	----	----	----	1.4	7,878	14,180	2,310	123	----
Same (face of 6 room, 7 right entry, 2,530 feet south 45° east, and 400 feet south 45° west of mine mouth).	21859	B	1	3.2	39.4	54.4	3.0	1.3	----	----	----	----	1.4	7,861	14,150	2,390	123	----
Same (face of 5 room, 6 right entry, 2,160 feet south 45° east, and 350 feet south 45° west of mine mouth).	21860	B	1	3.0	38.4	55.5	3.1	1.3	----	----	----	----	1.3	7,861	14,150	2,330	123	----
Same (composite of samples 21857 to 21860, inclusive)	21861	B	1	3.2	38.3	55.1	3.4	1.2	5.7	78.1	1.9	9.7	1.4	7,817	14,070	-------	123	----
			2	----	39.6	56.9	3.5	1.2	5.5	80.7	2.0	7.1	----	8,072	14,530	-------	----	----
			3	----	41.0	59.0	----	1.3	5.7	83.6	2.1	7.3	----	8,361	15,050	-------	----	----
1 mile east of; Pruden mine, Mingo bed (face of 4 room, 7 left entry, 3 main entry, 1,900 feet east of mine mouth).	21844	B	1	3.0	36.7	53.9	6.4	1.8	----	----	----	----	1.5	7,522	13,540	2,440	123	----
Same (face of 9 room, 17 left entry, 1 main entry, 2,100 feet south of mine mouth).	21845	B	1	3.2	37.3	55.5	4.0	1.1	----	----	----	----	1.6	7,756	13,960	2,500	123	----
Same (face of 17 right entry, 1 main entry, 3,000 feet south of main mouth).	21846	B	1	2.9	38.8	54.7	3.6	1.5	----	----	----	----	1.3	7,800	14,040	2,060	123	----
Same (face of 16 room, 5 right entry, 3 main entry, 1,300 feet south-southeast of mine mouth).	21847	B	1	3.0	37.2	55.4	4.4	1.3	----	----	----	----	1.4	7,739	13,930	2,420	123	----
Same (composite of samples 21844 to 21847, inclusive)	21848	B	1	3.1	37.1	55.3	4.5	1.4	5.6	77.2	2.0	9.3	1.5	7,706	13,870	-------	123	----
			2	----	38.3	57.1	4.6	1.4	5.4	79.7	2.1	6.8	----	7,956	14,320	-------	----	----
			3	----	40.2	59.8	----	1.5	5.7	83.6	2.2	7.0	----	8,339	15,010	-------	----	----
2 miles southwest of; Valley Creek mine, Mingo bed (face of 6 right aircourse).	79860	A	1	3.6	36.9	55.7	3.8	1.5	----	----	----	----	1.8	7,683	13,830	2,440	----	61
Same (face of 1 main entry)	79861	A	1	3.2	37.7	52.9	6.2	1.7	----	----	----	----	1.6	7,517	13,530	2,470	----	----
Same (face of 3 right entry)	79862	A	1	3.1	37.3	55.7	3.9	1.2	----	----	----	----	1.4	7,667	13,800	2,470	----	----
Same (face of 9 right entry)	79863	A	1	3.0	36.8	53.2	7.0	1.5	----	----	----	----	1.1	7,428	13,370	2,480	----	----
Same (composite of samples 79860 to 79863, inclusive)	79864	A	1	3.3	37.8	53.6	5.3	1.5	5.5	75.6	1.8	10.3	1.5	7,561	13,610	-------	----	----
			2	----	39.1	55.4	5.5	1.6	5.3	78.1	1.8	7.7	----	7,817	14,070	-------	----	----
			3	----	41.4	58.6	----	1.7	5.6	82.7	1.9	8.1	----	8,272	14,890	-------	----	----

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Rogerton; Rogerton mine, Jellico bed (head of main entry, 3,000 feet west of mine mouth).	32684	B	1	3.7	35.8	58.4	2.1	.8	5.5	78.7	1.9	11.0	1.6	7,661	13,790	2,330	----	62
			2	-----	37.1	60.7	2.2	.8	5.3	81.7	2.0	8.0	-----	7,956	14,320	-----	----	----
			3	-----	37.9	62.1	-----	.8	5.4	83.5	2.0	8.3	-----	8,128	14,630	-----	----	----
CUMBERLAND COUNTY																		
Crab Orchard, 1½ miles east of; Haley Mountain No. 1 mine, Sewanee bed (near head, 1 right entry, 1,300 feet southwest of mine mouth).	33471	B	1	2.6	27.4	62.7	7.3	.7	-----	-----	-----	-----	1.7	7,600	13,680	2,610	----	62
Same (1,300 feet east of mine mouth)	33472	B	1	2.6	28.2	61.9	7.3	.7	-----	-----	-----	-----	1.6	7,628	13,730	2,500	----	----
Same (composite of samples 33471 and 33472)	33473	B	1	2.5	27.8	62.3	7.4	.7	4.8	78.3	1.4	7.4	1.7	7,611	13,700	-----	----	----
			2	-----	28.5	63.9	7.6	.7	4.6	80.3	1.4	5.4	-----	7,811	14,060	-----	----	----
			3	-----	30.8	69.2	-----	.8	5.0	86.9	1.6	5.7	-----	8,450	15,210	-----	----	----
Litton, 4 miles north of; J. H. Hale & Son prospect, Sewanee (?) bed (in entry, 30 feet from entry mouth).	10800	B	1	4.3	25.7	62.5	7.5	.6	-----	-----	-----	-----	3.3	7,572	13,630	2,850	85	----
			2	-----	26.9	65.3	7.8	.6	-----	-----	-----	-----	-----	7,911	14,240	-----	----	----
Same, Morgan Springs bed (face of entry)	10802	B	1	6.1	27.8	55.5	10.6	3.1	-----	-----	-----	-----	5.0	7,072	12,730	2,310	85	----
			2	-----	29.5	59.3	11.2	3.3	-----	-----	-----	-----	-----	7,528	13,550	-----	----	----
Ozone, 2 miles north of; Fox Den mine, Sewanee bed (on 1 right at split, 600 feet from mine mouth).	33474	B	1	2.0	26.5	62.3	9.2	.6	4.5	76.6	1.4	7.7	1.3	7,528	13,550	2,570	----	62
			2	-----	27.0	63.6	9.4	.6	4.4	78.2	1.4	6.0	-----	7,683	13,830	-----	----	----
			3	-----	29.8	70.2	-----	.7	4.8	86.3	1.5	6.7	-----	8,472	15,250	-----	----	----
Nelson mine, Nelson bed (in entry, 300 feet west of mine mouth)	33475	B	1	2.8	31.8	58.8	6.6	.6	5.1	78.8	1.3	7.6	1.9	7,750	13,950	2,640	----	62
			2	-----	32.7	60.5	6.8	.7	4.9	81.1	1.4	5.1	-----	7,967	14,340	-----	----	----
			3	-----	35.1	64.9	-----	.7	5.3	87.0	1.5	5.5	-----	8,550	15,390	-----	----	----
Peavine, 2 miles east of; Peavine mine, Sewanee bed (prospect opening, 20 feet from opening).	80012	A	1	1.6	31.2	48.2	19.0	5.2	-----	-----	-----	-----	1.0	6,533	11,760	2,390	----	63
Same (in crosscut between 2 prospect entries, 35 feet from opening)	80013	A	1	1.8	31.2	50.0	17.0	4.8	-----	-----	-----	-----	1.2	6,667	12,000	2,340	----	----
Same (composite of samples 80012 and 80013, inclusive)	80014	A	1	1.8	31.1	49.1	18.0	5.0	4.6	66.5	1.4	4.5	1.1	6,606	11,890	-----	----	----
			2	-----	31.7	49.9	18.4	5.1	4.5	67.7	1.4	2.9	-----	6,728	12,110	-----	----	----
			3	-----	38.8	61.2	-----	6.2	5.5	83.0	1.7	3.6	-----	8,244	14,840	-----	----	----
Waldensia, 3 miles northwest of; Yellow Creek No. 1 mine, Lower Sewanee (?) bed (200 feet west of mine mouth).	2977	A	1	3.8	30.7	61.0	4.5	.8	-----	-----	-----	-----	2.7	7,878	14,180	-----	22	----
			2	-----	31.9	63.4	4.7	.8	-----	-----	-----	-----	-----	8,189	14,740	-----	----	----
FENTRESS COUNTY																		
Davidson, ½ mile north of; Highland No. 2 mine, Bon Air No. 2 bed (face of main entry, 1,350 feet north 41° east of mine mouth).	20982	B	1	3.0	37.3	50.2	9.5	2.8	-----	-----	-----	-----	1.8	7,328	13,190	2,190	123	----
Same (face of 2 right entry, 900 feet northeast of mine mouth)	20983	B	1	2.8	36.6	51.8	8.8	3.0	-----	-----	-----	-----	1.6	7,394	13,310	2,090	123	----
Same (face of 3 right entry, 1,300 feet east of mine mouth)	20984	B	1	2.5	36.7	50.4	10.4	3.3	-----	-----	-----	-----	1.4	7,283	13,110	2,030	123	----
Same (composite of samples 20982 to 20984, inclusive)	20985	B	1	2.8	36.9	50.6	9.7	3.0	5.4	72.7	1.4	7.8	1.6	7,344	13,220	-----	123	----
			2	-----	37.9	52.1	10.0	3.1	5.3	74.8	1.5	5.3	-----	7,550	13,590	-----	----	----
			3	-----	42.1	57.9	-----	3.4	5.9	83.0	1.6	6.1	-----	8,383	15,090	-----	----	----
Same (50 feet north of mouth of 2 left entry, 1,000 feet north 41° east of mine mouth).	20986	B	1	2.7	37.3	50.2	9.8	3.7	-----	-----	-----	-----	1.6	7,328	13,190	2,170	123	----
			2	-----	38.3	51.6	10.1	3.8	-----	-----	-----	-----	-----	7,528	13,550	-----	----	----
⅝ mile north of; Davidson mine, Bon Air No. 2 bed (face of main entry, 200 feet northeast of mine mouth).	20987	B	1	3.0	36.8	50.0	10.2	3.0	-----	-----	-----	-----	1.8	7,289	13,120	2,080	123	----
Same (face of main cross entry, 1,000 feet north-northeast of mine mouth).	20988	B	1	3.1	36.9	49.7	10.3	3.1	-----	-----	-----	-----	2.0	7,272	13,090	2,050	123	----
Same (composite of samples 20987 and 20988)	20989	B	1	3.1	36.6	50.1	10.2	3.0	5.5	72.0	1.4	7.9	1.9	7,272	13,090	-----	123	----
			2	-----	37.7	51.7	10.6	3.1	5.3	74.3	1.5	5.2	-----	7,506	13,510	-----	----	----
			3	-----	42.2	57.8	-----	3.5	5.9	83.1	1.7	5.8	-----	8,394	15,110	-----	----	----
Gernt; East Laurel mine, White Oak bed (head of slope, 100 feet west of mine mouth).	32789	B	1	6.3	33.9	53.7	6.1	1.2	-----	-----	-----	-----	4.3	7,217	12,990	2,360	----	----
			2	-----	36.2	57.3	6.5	1.3	-----	-----	-----	-----	-----	7,706	13,870	-----	----	----

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, ° F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
FENTRESS COUNTY—continued																		
Wilder; Fentress mine, Wilder bed (1,500 feet east of drift mouth)	2980	A	1	3.0	36.4	50.5	10.1	3.8	-----	-----	-----	-----	1.8	7,211	12,980	-----	22	----
			2	-----	37.5	52.0	10.5	4.0	-----	-----	-----	-----	-----	7,439	13,390	-----	-----	----
Wilder mine, Wilder bed (face of 1 room, 3 entry)	1619	A	1	2.5	36.0	49.8	11.7	2.5	-----	-----	-----	-----	1.0	-----	-----	-----	22	----
			2	-----	36.9	51.1	12.0	2.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
1½ miles northeast of; Wilder No. 3 mine, Bon Air No. 2 bed (head of 3 left entry, slope entry, 5,000 feet southeast of mine mouth).	33449	B	1	4.1	34.3	50.7	10.9	3.5	-----	-----	-----	-----	2.8	6,961	12,530	2,050	----	63
Same (head of 2 right entry, slope entry)	33450	B	1	3.0	35.2	52.2	9.6	3.1	-----	-----	-----	-----	1.7	7,172	12,910	2,220	----	----
Same (head of 3 left entry, 4,000 feet northwest of mine mouth)	33451	B	1	3.1	35.2	51.6	10.1	3.2	-----	-----	-----	-----	1.8	7,167	12,900	2,230	----	----
Same (head of 8 left entry, 5,000 feet northwest of mine mouth)	33452	B	1	3.6	35.1	51.3	10.0	3.7	-----	-----	-----	-----	2.2	7,111	12,800	2,230	----	----
Same (composite of samples 33449 to 33452, inclusive)	33453	B	1	3.6	34.9	51.4	10.1	3.4	4.9	70.7	1.4	9.5	2.1	7,117	12,810	-----	----	----
			2	-----	36.2	53.3	10.5	3.5	4.7	73.3	1.4	6.6	-----	7,383	13,290	-----	----	----
			3	-----	40.5	59.5	-----	3.9	5.2	81.8	1.6	7.5	-----	8,244	14,840	-----	----	----
2 miles east of; Big Laurel No. 2 mine, Wilder bed (head of 1 right entry, 600 feet southeast of mine mouth).	33476	B	1	2.0	35.9	51.1	11.0	3.2	5.0	72.0	1.4	7.4	.8	7,211	12,980	2,260	----	63
			2	-----	36.6	52.2	11.2	3.2	4.9	73.5	1.4	5.8	-----	7,356	13,240	-----	----	----
			3	-----	41.3	58.7	-----	3.7	5.5	82.7	1.6	6.5	-----	8,283	14,910	-----	----	----
Zenith; White Oak mine, White Oak bed (head of short dog off straight right entry).	32798	B	1	6.8	31.7	55.4	6.1	.4	-----	-----	-----	-----	4.9	7,156	12,880	2,550	----	64
Same (near head of room, main st aight left entry)	32799	B	1	5.4	34.0	55.9	4.7	.4	-----	-----	-----	-----	3.5	7,394	13,310	2,460	----	----
Same (head of 2 left entry, main straight left entry)	32800	B	1	6.3	34.0	54.8	4.9	.4	-----	-----	-----	-----	4.2	7,344	13,220	2,500	----	----
Same (composite of samples 32798 to 32800, inclusive)	32801	B	1	6.4	33.1	55.3	5.2	.4	5.3	75.0	1.2	12.9	4.4	7,294	13,130	-----	----	----
			2	-----	35.4	59.0	5.6	.4	4.9	80.1	1.3	7.7	-----	7,789	14,020	-----	----	----
			3	-----	37.5	62.5	-----	.4	5.2	84.8	1.4	8.2	-----	8,250	14,850	-----	----	----
GRUNDY COUNTY																		
Coalmont; B mine, Sewanee bed (1,900 feet north of mine mouth)	2995	A	1	3.4	29.2	58.2	9.2	.7	-----	-----	-----	-----	2.3	7,344	13,220	-----	22	----
			2	-----	30.3	60.2	9.5	.8	-----	-----	-----	-----	-----	7,600	13,690	-----	----	----
¼ mile northwest of; Coalmont E mine, Sewanee bed (face of main entry, 500 feet east of mine mouth).	22384	B	1	3.1	30.0	57.6	9.3	1.2	-----	-----	-----	-----	1.6	7,339	13,210	2,530	123	----
¼ mile northwest of; Coalmont I mine, Sewanee bed (face of 11 room, 2 left entry, 1,140 feet north 37° west, and 500 feet south 55° west of mine mouth)	22383	B	1	3.1	30.2	54.5	12.2	.9	-----	-----	-----	-----	1.7	7,117	12,810	2,630	123	----

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Same, Coalmont New A mine (room neck, main entry, 600 feet northeast of mine mouth).	22385	B	1	2.6	29.6	54.9	12.9	1.2					1.0	7,072	12,730	2,460	123	
Same, Coalmont Old A mine (room neck, main entry, 300 feet east of mine mouth).	22386	B	1	3.1	29.8	57.3	9.8	1.0					1.5	7,306	13,150	2,530	123	
Same (composite of samples 22383 to 22386, inclusive)	22387	B	1	2.9	29.8	56.3	11.0	1.1	4.8	73.3	1.5	8.3	1.4	7,217	12,990		123	
			2		30.6	58.1	11.3	1.1	4.6	75.5	1.6	5.9		7,433	13,380			
			3		34.5	65.5		1.3	5.2	85.1	1.8	6.6		8,383	15,090			
1½ miles west of; Dixie No. 4 mine, Sewanee bed (face of 3 right room, main entry).	32584	B	1	3.3	30.0	57.2	9.5	.6					1.5	7,311	13,160	2,750		64
			2		31.0	59.2	9.8	.6						7,561	13,610			
2 miles southeast of; Flanagan mine, Sewanee bed (face of main entry, 700 feet east and 300 feet south of mine mouth).	22373	B	1	2.9	30.1	58.1	8.9	.7					1.9	7,361	13,250	2,420	123	
			2		31.0	59.8	9.2	.7						7,583	13,650			
2½ miles south-southeast of; Coalmont S. O. Hill mine, Sewanee bed (face of 1 right entry, main entry, 1,063 feet south 75° west of mine mouth).	22375	B	1	3.2	30.0	57.0	9.8	.8					2.2	7,283	13,110		123	
			2		31.0	58.9	10.1	.8						7,528	13,550			
Same (face of main entry, 2,380 feet south 56° west of mine mouth)	22374	B	1	3.1	29.0	58.8	9.1	.8					1.9	7,389	13,300	2,580	123	
			2		29.9	60.7	9.4	.9						7,628	13,730			
11½ miles north, 40° east of; Mill Creek prospect pit, Sewanee bed (face of bed, 60 feet east of mine mouth).	22379	B	1	3.1	31.7	55.0	10.2	2.7					1.8	7,333	13,200	2,210	123	
Another prospect pit, Sewanee bed (face of drift, 50 feet south of pit mouth).	22380	B	1	4.3	28.3	60.1	7.3	.6					3.0	7,456	13,420		123	
Same (face of entry, 100 feet east of pit mouth)	22381	B	1	3.3	30.1	58.3	8.3	.9					1.7	7,428	13,370	2,690	123	
Same (composite of samples 22379 to 22381, inclusive)	22382	B	1	3.6	29.8	57.9	8.7	1.4	5.0	75.2	1.5	8.2	2.2	7,406	13,330		123	
			2		30.9	60.1	9.0	1.4	4.7	78.0	1.6	5.3		7,683	13,830			
			3		34.0	66.0		1.6	5.2	85.7	1.7	5.8		8,444	15,200			
Fremont; Tracy City No. 3 mine, Sewanee bed (face of 2 room, 1 left entry, 2 left entry).	32582	B	1	3.2	30.3	57.7	8.8	.6					1.7	7,383	13,290	2,640		65
			2		31.3	59.6	9.1	.7						7,628	13,730			
No. 4 mine, Sewanee bed (face of 7 room, 2 left entry)	32583	B	1	2.9	29.8	59.2	8.1	.6					1.9	7,428	13,370	2,400		65
			2		30.7	61.0	8.3	.6						7,656	13,780			
Palmer, 1 mile south of; Tennessee Consolidated No. 8 mine, Sewanee bed (at heading, main entry, 960 feet from mine mouth).	32586	B	1	4.2	28.9	58.6	8.3	.7	4.9	75.1	1.5	9.5	2.5	7,317	13,170	2,610		65
			2		30.2	61.2	8.6	.7	4.7	78.4	1.5	6.1		7,639	13,750			
			3		33.0	67.0		.8	5.1	85.8	1.7	6.6		8,356	15,040			
No. 16 mine, Sewanee bed (face of main entry, 340 feet beyond 1 cross entry).	32587	B	1	2.8	29.0	59.0	9.2	.6	5.0	76.0	1.4	7.8	1.2	7,372	13,270	2,690		65
			2		29.9	60.6	9.5	.6	4.8	78.2	1.5	5.4		7,589	13,660			
			3		33.0	67.0		.7	5.3	86.3	1.6	6.1		8,378	15,080			
1 mile north of; Palmer mine, Sewanee bed (face of 9 entry, South Spruce opening).	80064	A	1	2.0	31.2	54.1	12.7	3.0					1.0	7,206	12,970	2,010		65
Same (face of E entry, South Spruce opening)	80065	A	1	2.6	29.7	59.6	8.1	.7					1.3	7,522	13,540	2,620		
Same (face of 4 main entry)	80066	A	1	2.2	31.0	56.6	10.2	2.8					1.1	7,378	13,280	1,990		
Same (face of 2 left entry, No. 1 (Mill Creek) opening)	80067	A	1	3.3	30.1	56.2	10.4	2.9					2.1	7,244	13,040	2,040		
Same (face of 1 left entry, 16 entry, North Spruce opening)	80068	A	1	2.9	28.6	57.5	11.0	.8					1.6	7,272	13,090	2,730		
Same (face of 22 entry)	80069	A	1	2.7	29.1	58.1	10.1	.7					1.4	7,350	13,230	2,730		
Same (composite of samples 80064 to 80069, inclusive)	80070	A	1	2.5	29.9	57.3	10.3	1.8	4.9	74.0	1.4	7.6	1.4	7,328	13,190			
			2		30.7	58.7	10.6	1.8	4.8	75.9	1.5	5.4		7,517	13,530			
			3		34.3	65.7		2.1	5.3	84.9	1.7	6.0		8,406	15,130			
Tracy City, 1 mile east of; Old Staub mine, Sewanee bed (face of Jerry Downing entry, old main entry of No. 1 mine, 5,850 feet north 20° west of old No. 1 mine mouth).	22371	B	1	4.1	28.4	58.7	8.8	.6					2.8	7,283	13,110	2,390	123	
			2		29.6	61.2	9.2	.6						7,594	13,670			
1¼ miles northeast of; East Fork mine, Sewanee bed (room, 2 right entry, 1 main entry, 1,600 feet south 16 ° west of mine mouth).	22361	B	1	3.1	31.8	55.1	10.0	2.0					1.7	7,328	13,190	2,300	123	
1¼ miles north-northeast of; East Staub mine, Sewanee bed (near 1 right entry, Campbell entry, 4,600 feet north 20° east of mine mouth).	22363	B	1	3.9	27.5	57.8	10.8	.6					2.4	7,144	12,860	2,500	123	

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, ° F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
GRUNDY COUNTY—continued																		
Tracy City, 1¼ miles north-northeast of; East Staub mine, Sewanee bed (composite of samples 22359 to 22363, inclusive).	22364	B	1	3.3	29.9	56.5	10.3	1.5	5.0	73.9	1.4	7.9	1.9	7,300	13,140	-------	123	----
			2	----	30.9	58.5	10.6	1.6	4.8	76.4	1.4	5.2	----	7,489	13,480	-------	----	----
			3	----	34.6	65.4	----	1.8	5.4	85.5	1.6	5.7	----	8,383	15,090	-------	----	----
1½ miles east of; Reed Hill No. 1 mine, Sewanee bed (room, main entry, 2,400 feet south of mine mouth).	22359	B	1	3.4	29.2	58.5	8.9	.6	----	----	----	----	1.8	7,356	13,240	-------	123	----
1¾ miles northeast of; Rattlesnake mine, Sewanee bed (face of crosscut, Old Rattlesnake entry, 2,100 feet north 10° west of mine mouth).	22362	B	1	3.5	28.7	58.4	9.4	.6	----	----	----	----	2.0	7,317	13,170	-------	123	----
2 miles east of; Reed Hill No. 2 mine, Sewanee bed (face of Sitz entry, near face of old No. 7 in old Reed Hill mine, 1,300 feet north and 75° west of mine mouth).	22360	B	1	2.6	31.8	53.9	11.7	3.7	----	----	----	----	1.4	7,189	12,940	1,970	123	----
2½ miles west of; West Ramsey mine, Sewanee bed (near face of Saunders entry, old N. C. main entry, 850 feet south 60° west of mine mouth near old Ramsey Tipple).	22403	B	1	4.5	29.1	58.7	7.7	.6	----	----	----	----	2.7	7,333	13,200	2,690	123	----
2½ miles north-northwest of; Old Ramsey mine (near 11 right entry, old T. C. I. main entry, 2,600 feet north 45° east of opening near old Ramsey Tipple).	22404	B	1	3.9	29.5	58.6	8.0	.6	----	----	----	----	2.1	7,356	13,240	2,930	123	----
Same (composite of 22403 and 22404)	22405	B	1	4.2	29.1	58.9	7.8	.6	5.0	75.3	1.5	9.8	2.4	7,350	13,230	-------	123	----
			2	----	30.4	61.5	8.1	.6	4.8	78.6	1.6	6.3	----	7,678	13,820	-------	----	----
			3	----	33.1	66.9	----	.7	5.2	85.5	1.8	6.8	----	8,350	15,030	-------	----	----
3½ miles west-northwest of; Old Clouse Hill mine, Sewanee bed (room, 200 feet east of mine mouth).	22372	B	1	3.9	30.7	56.7	8.7	.8	----	----	----	----	2.5	7,250	13,050	2,590	123	----
			2	----	32.0	59.0	9.0	.8	----	----	----	----	----	7,544	13,580	-------	----	----
HAMILTON COUNTY																		
Daisy, ¾ mile northwest of; Abel (drift) mine, unidentified bed (face of 2 room, main entry, 350 feet north-northeast of mine mouth).	22249	B	1	2.6	30.4	58.3	8.7	1.5	----	----	----	----	1.7	7,683	13,830	2,100	123	----
			2	----	31.2	59.8	9.0	1.5	----	----	----	----	----	7,889	14,200	-------	----	----
Montlake, 2⅜ miles northwest of; Montlake No. 4 mine, unnamed bed (face of 1 right entry, 185 feet north 4° east, and 415 feet south 86° east of mine mouth).	22247	B	1	4.3	25.7	59.2	10.8	1.6	----	----	----	----	3.1	7,217	12,990	2,620	123	----
			2	----	26.8	61.9	11.3	1.7	----	----	----	----	----	7,539	13,570	-------	----	----
2½ miles northwest of; Montlake mine, No. 10 bed (face of 3 crosscut entry, 1,400 feet north 30° east of mine mouth).	22243	B	1	3.4	28.1	58.6	9.9	2.4	----	----	----	----	2.5	7,433	13,380	2,190	123	----
Same (face of 11 cross entry, 2,850 feet north 32° east of mine mouth)	22244	B	1	2.5	29.0	55.0	13.5	4.3	----	----	----	----	1.6	7,128	12,830	1,980	123	----

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Same (face of 11 right cross entry, 2,700 feet north 20° east of mine mouth).	22245	B	I	2.6	29.8	57.7	9.9	2.5					1.8	7,478	13,460	2,280	123	
Same (composite of samples 22243 to 22245, inclusive)	22246	B	1	2.9	29.0	57.1	11.0	3.0	4.9	73.9	1.3	5.9	2.0	7,339	13,210		123	
			2		29.9	58.7	11.4	3.1	4.7	76.1	1.4	3.3		7,556	13,600			
			3		33.7	66.3		3.5	5.3	85.9	1.6	3.7		8,522	15,340			
Rathburn, ¾ mile west of; Furman mine, Soddy bed (face of Jones place, 650 feet north 15° west of mine mouth).	22211	B	1	3.0	29.5	61.9	5.6	.7					1.9	7,872	14,170	3,010	123	
Same (face of 4 room, 1 right entry, 700 feet north 10° west of mine mouth).	22212	B	1	2.7	30.2	60.4	6.7	.7					1.6	7,711	13,880	2,570	123	
Same (composite of samples 22211 and 22212)	22213	B	1	2.7	29.8	61.3	6.2	.7	5.3	79.4	1.3	7.1	1.8	7,789	14,020		123	
			2		30.7	62.9	6.4	.7	5.1	81.7	1.3	4.8		8,006	14,410			
			3		32.8	67.2		.8	5.5	87.2	1.4	5.1		8,550	15,390			
1¼ miles southwest of; Old Bunker mine, Soddy bed (face of 5 room, main entry, 500 feet north 80° west of mine mouth).	22190	B	1	3.2	28.3	64.5	4.0	.7					2.0	7,950	14,310	2,610	123	
			2		29.2	66.7	4.1	.7						8,211	14,780			
1¼ miles west of; Soddy No. 1 mine, Soddy bed (face of 43 room, 5 right entry, new haulageway, 8,900 feet south 75° west of mine mouth).	22160	B	1	2.8	27.8	61.5	7.9	1.0					1.9	7,672	13,810	2,230	123	
Same (face of 3 room, 11 right entry, new haulageway, 9,300 feet south 65° west of mine mouth).	22161	B	1	2.6	29.5	62.5	5.4	1.2					1.7	7,917	14,250		123	
Same (face of 14 right entry, new main entry, 7,000 feet north 85° west of mine mouth).	22162	B	1	2.9	29.9	59.2	8.0	1.2					1.9	7,644	13,760	2,260	123	
Same (face of 1 room, 17 right entry, main entry, 8,200 feet west of mine mouth).	22163	B	1	2.5	29.6	61.0	6.9	1.5					1.5	7,756	13,960	2,180	123	
Same (composite of samples 22160 to 22163, inclusive)	22164	B	1	2.7	29.1	61.1	7.1	1.3	5.2	78.9	1.5	6.0	1.7	7,750	13,950		123	
			2		29.9	62.8	7.3	1.3	5.1	81.0	1.5	3.8		7,961	14,330			
			3		32.3	67.7		1.4	5.5	87.4	1.6	4.1		8,589	15,460			
1½ miles southwest of; Sheephead mine, Soddy bed (face of 3 room, new slope, 400 feet north 10° west of mine mouth).	22187	B	1	3.5	26.7	60.0	9.8	.8					2.5	7,439	13,390	2,720	123	
Same (face of 6 room, back entry, 350 feet south 40° west of mine mouth).	22188	B	1	3.4	27.4	58.7	10.5	1.0					2.3	7,383	13,290	2,960	123	
Same (composite of samples 22187 and 22188)	22189	B	1	3.4	27.1	59.4	10.1	.9	5.1	75.7	1.4	6.8	2.4	7,406	13,330		123	
			2		28.0	61.5	10.5	.9	5.0	78.4	1.5	3.7		7,667	13,800			
			3		31.3	68.7		1.0	5.5	87.5	1.6	4.4		8,567	15,420			
2¼ miles northwest of; Big Soddy mine, Soddy bed (8 room, main entry, 1,200 feet north 25° east of mine mouth).	22248	B	1	3.3	28.0	63.7	5.0	1.6					1.9	7,806	14,050	2,420	123	
			2		28.9	65.9	5.2	1.7						8,072	14,530			
MARION COUNTY																		
Orme, 1 mile north of; Battle Creek mine, Battle Creek bed (2,200 feet northeast of mine mouth).	3009	A	1	3.3	31.7	51.9	13.1	1.3					2.0	6,772	12,190		22	
			2		32.8	53.6	13.6	1.3						7,006	12,610			
1½ miles north of; Battle Creek No. 3 mine, Battle Creek bed (pillar, Collins entry, 1,550 feet west of mine mouth).	22231	B	1	3.4	34.9	53.2	8.5	1.1					1.5	7,367	13,260	2,620	123	
1½ miles north of; Battle Creek No. 4 mine, Battle Creek bed (pillar, 5 right entry, 1,600 feet north and 750 feet east of mine mouth).	22230	B	1	2.9	34.9	48.9	13.3	2.0					1.3	6,994	12,590	2,400	123	
Same (pillar, face of 16 left entry, 2,500 feet north and 1,500 feet west of mine mouth).	22233	B	1	3.0	37.3	52.4	7.3	1.8					1.4	7,544	13,580	2,410	123	
2¾ miles north-northwest of; Battle Creek No. 5 mine, Battle Creek bed (main entry, 60 feet east of mine mouth).	22232	B	1	3.1	36.9	50.9	9.1	1.4					1.7	7,383	13,290		123	
Same (composite of samples 22230 to 22233, inclusive)	22234	B	1	3.1	35.8	51.6	9.5	1.6	5.4	73.9	1.4	8.2	1.5	7,333	13,200		123	
			2		37.0	53.2	9.8	1.6	5.2	76.3	1.5	5.6		7,567	13,620			
			3		41.0	59.0		1.8	5.8	84.5	1.6	6.3		8,389	15,100			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MARION COUNTY—continued																		
Tracy City, 5½ miles east of; Pryor Ridge No. 1 mine, Sewanee bed (face of 6 room, Thompson entry, left main entry, 1,200 feet north 10° east of mine mouth).	22398	B	1	2.9	29.8	56.6	10.7	2.6	----	----	----	----	1.6	7,272	13,090	2,080	123	----
Same (face of 4 right entry, 5 right entry, left main entry, 2,700 feet east of mine mouth).	22399	B	1	3.0	29.7	57.5	9.8	1.3	----	----	----	----	1.8	7,311	13,160	2,600	123	----
Same (face of 5 right entry, right main entry, 1,800 feet north 45° west of mine mouth).	22400	B	1	2.8	30.7	54.7	11.8	4.3	----	----	----	----	1.7	7,150	12,870	1,980	123	----
Same (20 stump, 5 left entry, right main entry, 1,900 feet south 80° west of mine mouth).	22401	B	1	3.3	29.5	58.2	9.0	.8	----	----	----	----	1.8	7,383	13,290	2,670	123	----
Same (composite of samples 22398 to 22401, inclusive)	22402	B	1	3.1	29.6	57.0	10.3	2.2	4.9	73.9	1.4	7.3	1.7	7,289	13,120	----	123	----
			2	----	30.5	58.9	10.6	2.3	4.7	76.3	1.5	4.6	----	7,517	13,530	----	----	----
			3	----	34.2	65.8	----	2.6	5.3	85.4	1.6	5.1	----	8,411	15,140	----	----	----
7 miles east of; Long Ridge mine, Sewanee bed (face of main entry, 250 feet south 45° east of mine mouth).	22370	B	1	3.8	28.4	59.3	8.5	1.1	----	----	----	----	2.5	7,322	13,180	2,580	123	----
			2	----	29.6	61.4	9.0	1.2	----	----	----	----	----	7,611	13,700	----	----	----
Whiteside, 1 mile southwest of; Bessie prospect, Old Etna bed (rib, main entry, 400 feet south of mine mouth).	22258	B	1	5.2	25.3	67.4	2.1	.6	----	----	----	----	4.0	8,017	14,430	----	123	----
			2	----	26.7	71.1	2.2	.7	----	----	----	----	----	8,450	15,210	----	----	----
1 mile west of; Castle Rock mine, Castle Rock bed (face of main entry, 200 feet south of mine mouth).	22254	B	1	4.1	23.8	62.2	9.9	2.3	----	----	----	----	3.2	7,411	13,340	2,300	123	----
Same (face of 1 right entry, 175 feet south 20° west of mine mouth)	22255	B	1	3.6	23.0	61.7	11.7	2.7	----	----	----	----	2.7	7,256	13,060	----	123	----
Same (composite of samples 22254 and 22255)	22256	B	1	3.8	23.4	62.0	10.8	2.5	4.8	74.8	1.1	6.0	3.0	7,328	13,190	----	123	----
			2	----	24.4	64.4	11.2	2.6	4.5	77.7	1.2	2.8	----	7,617	13,710	----	----	----
			3	----	27.4	72.6	----	2.9	5.1	87.5	1.3	3.2	----	8,572	15,430	----	----	----
1 mile southwest of; Clements prospect, Castle Rock bed (rib of main entry, 100 feet southwest of mine mouth).	22257	B	1	2.7	25.1	61.3	10.9	2.9	----	----	----	----	1.8	7,389	13,300	2,210	123	----
			2	----	25.8	63.0	11.2	3.0	----	----	----	----	----	7,594	13,670	----	----	----
1⅛ miles west of; Old Etna No. 1 mine, Old Etna bed (face of main entry, 165 feet west of mine mouth).	22251	B	1	4.5	26.3	66.7	2.5	.7	----	----	----	----	3.6	8,122	14,620	2,140	123	----
1⅛ miles west of; Old Etna No. 2 mine, Old Etna bed (face of main entry, 200 feet south-southwest of mine mouth).	22252	B	1	5.7	26.7	64.7	2.9	1.1	----	----	----	----	4.8	7,989	14,380	----	123	----
Same (composite of samples 22251 and 22252)	22253	B	1	5.1	26.6	65.6	2.7	.9	5.4	81.9	1.5	7.6	4.2	8,050	14,490	----	123	----
			2	----	28.0	69.2	2.8	1.0	5.0	86.3	1.5	3.4	----	8,483	15,270	----	----	----
			3	----	28.8	71.2	----	1.0	5.2	88.8	1.6	3.4	----	8,728	15,710	----	----	----

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7 miles northwest of; New Etna No. 1 mine, Kelley bed (face of 4 cross entry, 3,000 feet northwest of mine mouth).	22235	B	1	3.2	27.8	59.6	9.4	1.3					2.1	7,517	13,530	2,660	123	
Same (face of 7 cross entry, 2,000 feet northeast of mine mouth)	22236	B	1	3.6	27.4	62.0	7.0	1.2					2.7	7,711	13,880		123	
7 miles northwest of; New Etna No. 2 mine, Kelley bed (face of 1 left entry, 1,000 feet southwest of mine mouth).	22237	B	1	3.7	28.0	62.9	5.4	1.3					2.6	7,822	14,080	2,400	123	
Same (composite of samples 22235 to 22237, inclusive)	22238	B	1	3.5	27.6	61.7	7.2	1.3	5.2	78.1	1.6	6.6	2.4	7,667	13,800		123	
			2		28.6	64.0	7.4	1.3	4.9	80.9	1.7	3.8		7,950	14,310			
			3		30.9	69.1		1.4	5.3	87.5	1.8	4.0		8,589	15,460			
Whitwell, 1 mile southwest of; Whitwell No. 1 mine, Sewanee bed (face of 23 south entry, 5,500 feet south 21° west of mine mouth).	22267	B	1	3.3	28.5	59.9	8.3	.6					1.8	7,478	13,460	2,560	123	
1¾ miles northwest of; Whitwell No. 5 mine, Sewanee bed (face of 7 north entry, main haulageway, 1,150 feet north 39° east of main haulageway south opening).	22268	B	1	3.3	28.6	59.6	8.5	.8					1.8	7,444	13,400	2,480	123	
Same (face of main slope entry, 500 feet north, and 2,750 feet north 21° east of main haulageway).	22269	B	1	3.6	28.1	60.0	8.3	1.1					2.2	7,444	13,400	2,460	123	
Same (face of 4 north entry, main haulageway, 1,850 feet north 39° east of mine mouth).	22270	B	1	3.2	28.9	59.5	8.4	.8					1.7	7,472	13,450	2,490	123	
Same (composite of samples 22267 to 22270, inclusive)	22271	B	1	3.4	28.2	60.1	8.3	.8	5.0	76.5	1.5	7.9	1.9	7,461	13,430		123	
			2		29.1	62.3	8.6	.8	4.8	79.2	1.5	5.1		7,722	13,900			
			3		31.9	68.1		.9	5.3	86.6	1.7	5.5		8,450	15,210			
MORGAN COUNTY																		
Blue Gem siding; Denny mine, Hooper bed (head of main entry, 500 feet from mine mouth).	88806	B	1	1.7	39.3	55.6	3.4	2.1					.9	7,906	14,230	2,340		
			2		40.0	56.6	3.4	2.1						8,039	14,470			
½ mile north of; Jones Bros. mine, Hooper bed (head of main entry)	88807	B	1	2.5	37.5	56.5	3.5	1.4	5.5	78.0	2.1	9.5	1.7	7,800	14,040	2,390		
			2		38.4	58.0	3.6	1.5	5.4	79.9	2.1	7.5		7,994	14,390			
			3		39.9	60.1		1.5	5.6	82.9	2.2	7.8		8,294	14,930			
⅝ mile north of; Webster & Alcock mine, Hooper bed (head of left entry).	88811	B	1	2.4	38.0	53.3	6.3	1.3					1.6	7,572	13,630	2,620		
			2		38.9	54.6	6.5	1.3						7,761	13,970			
2 miles west-southwest of; Bottomlee mine, Blue Gem bed (face of 1 right entry, 650 feet west of mine mouth).	21150	B	1	2.7	38.9	54.3	4.1	1.6					1.4	7,944	14,300	2,110	123	
			2		39.9	55.9	4.2	1.7						8,156	14,680			
Coal Cut mine, Blue Gem bed (main entry, 250 feet east of mine mouth).	21145	B	1	3.0	39.6	53.2	4.2	1.3					1.5	7,794	14,030	2,480	123	
			2		40.9	54.7	4.4	1.4						8,033	14,460			
Catoosa; Catoosa No. 1 mine (head of main entry, 1,000 feet northeast of mine mouth).	32743	B	1	1.4	33.3	57.0	8.3	3.4					.1	7,633	13,740	2,210		
Same (head of 5 left entry, 800 feet north of mine mouth)	32744	B	1	1.4	33.6	56.8	8.2	3.2					.1	7,661	13,790	2,360		
Same (composite of samples 32743 and 32744)	32745	B	1	1.4	33.8	56.6	8.2	3.3	5.0	76.3	1.6	5.6	.1	7,656	13,780			
			2		34.3	57.3	8.4	3.3	5.0	77.4	1.6	4.3		7,761	13,970			
			3		37.4	62.6		3.6	5.4	84.4	1.8	4.8		8,467	15,240			
Red Eye mine (head of 7 right entry, 900 feet south-southwest of mine mouth).	32758	B	1	3.8	31.9	55.6	8.7	2.9					2.7	7,450	13,410	2,260		66
			2		33.2	57.7	9.1	3.0						7,744	13,940			
1,000 feet west of; Panther No. 2 mine, Catoosa bed (head of cross entry from 5 right entry, 1,200 feet south of mine mouth).	32746	B	1	4.1	32.0	58.2	5.7	2.4					3.0	7,772	13,990	2,380		66
Same (head of 5 right entry, 1,200 feet south-southeast of mine mouth)	32747	B	1	4.1	32.5	56.8	6.6	2.4					3.0	7,661	13,790	2,270		
Same (composite of samples 32746 and 32747)	32748	B	1	4.1	32.2	57.5	6.2	2.4	5.3	77.4	1.6	7.1	3.0	7,728	13,910			
			2		33.6	59.9	6.5	2.5	5.1	80.7	1.6	3.6		8,050	14,490			
			3		35.9	64.1		2.7	5.4	86.3	1.8	3.8		8,606	15,490			
1 mile east of; Cow Ford No. 4 mine, Catoosa bed (head of main right entry, 1,500 feet south of mine mouth).	32756	B	1	3.6	30.0	59.4	7.0	1.4					2.3	7,589	13,660	2,540		67
			2		31.1	61.7	7.2	1.5						7,878	14,180			
Cow Ford No. 5 mine (head of main entry, 80 feet southwest of mine mouth).	32757	B	1	4.5	31.0	59.7	4.8	1.1					3.5	7,778	14,000	2,560		67
			2		32.4	62.6	5.0	1.2						8,139	14,650			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MORGAN COUNTY—continued																		
Christmas siding, ¼ mile south of; Smith mine, Hooper bed (?) (rib, main entry, 100 feet south of mine mouth).	21153	B	1	3.6	36.4	54.7	5.3	0.8	----	----	----	----	2.1	7,728	13,910	2,590	123	----
			2	----	37.7	56.8	5.5	.8	----	----	----	----	----	8,017	14,430	----	----	----
½ mile west of; Harriman mine, Hooper bed (rib, main slope, 50 feet south of mine mouth).	21152	B	1	3.3	39.5	54.7	2.5	.7	----	----	----	----	2.0	8,022	14,440	2,330	123	----
			2	----	40.9	56.5	2.6	.7	----	----	----	----	----	8,300	14,940	----	----	----
1½ miles west of; Grassy Ridge mine, Grassy Ridge bed (rib, main entry of new opening, 250 feet north of mine mouth).	21151	B	1	3.0	39.3	54.1	3.6	1.8	----	----	----	----	1.7	7,956	14,320	2,470	123	----
			2	----	40.5	55.7	3.8	1.9	----	----	----	----	----	8,200	14,760	----	----	----
Coalfield, ¾ mile west of; Davis mine, Coal Creek (?) bed (1 right entry, 200 feet from main entry).	21147	B	1	3.5	36.6	55.4	4.5	1.4	----	----	----	----	2.1	7,772	13,990	2,390	123	----
			2	----	37.9	57.4	4.7	1.5	----	----	----	----	----	8,056	14,500	----	----	----
1¼ miles southeast of; Thornton mine, Blue Gem bed (face of 1 left entry, 100 feet north and 50 feet west of mine mouth).	21146	B	1	4.5	37.0	47.4	11.1	4.4	----	----	----	----	3.2	7,039	12,670	2,140	123	----
			2	----	38.8	49.6	11.6	4.6	----	----	----	----	----	7,372	13,270	----	----	----
1½ miles northeast of; Bowing mine, Coal Creek bed (6 left entry, 1 entry, 2,400 feet north 30° west of mine mouth).	21104	B	1	1.6	38.4	51.4	8.6	5.0	----	----	----	----	.9	7,661	13,790	2,080	123	----
Same (main Fisher entry, 600 feet northeast of mine mouth)	21105	B	1	2.4	36.3	54.3	7.0	3.1	----	----	----	----	1.4	7,689	13,840	2,170	123	----
Same (composite of samples 21104 and 21105)	21106	B	1	2.0	37.5	52.6	7.9	4.0	5.5	75.0	1.7	5.9	1.1	7,672	13,810	----	123	----
			2	----	38.3	53.6	8.1	4.1	5.4	76.5	1.8	4.1	----	7,828	14,090	----	----	----
			3	----	41.7	58.3	----	4.5	5.8	83.2	1.9	4.6	----	8,517	15,330	----	----	----
1½ miles northeast of; Conger (Old Baker) mine, Coal Creek bed (face of 2 right entry, 1,800 feet northeast of mine mouth).	21100	B	1	2.2	38.5	51.6	7.7	4.3	----	----	----	----	1.4	7,711	13,880	2,190	123	----
Same (face of 6 right entry, 2,000 feet northeast of mine mouth)	21101	B	1	1.8	39.3	52.1	6.8	3.6	----	----	----	----	1.0	7,822	14,080	2,150	123	----
Same (face of 8 right entry, 2,000 feet northeast of mine mouth)	21102	B	1	1.8	38.0	50.3	9.9	4.3	----	----	----	----	1.0	7,539	13,570	2,190	123	----
Same (composite of samples 21100 to 21102, inclusive)	21103	B	1	1.9	38.5	51.5	8.1	4.0	5.6	75.3	1.8	5.2	1.1	7,694	13,850	----	123	----
			2	----	39.2	52.5	8.3	4.1	5.5	76.7	1.8	3.6	----	7,839	14,110	----	----	----
			3	----	42.8	57.2	----	4.5	6.0	83.6	2.0	3.9	----	8,550	15,390	----	----	----
1½ miles northeast of; Slope mine, Coal Creek bed (mouth of 1 east entry, 250 feet northeast of mine mouth).	21099	B	1	3.3	39.1	52.9	4.7	3.3	----	----	----	----	2.6	7,889	14,200	2,200	123	----
			2	----	40.4	54.7	4.9	3.4	----	----	----	----	----	8,161	14,690	----	----	----
3 miles southwest of; Three Rock mine, Hooper bed (1 room, 1 left entry, 200 feet southwest of mine mouth).	32698	B	1	3.1	38.4	56.1	2.4	.8	5.6	80.2	1.9	9.1	1.5	7,956	14,320	2,280	----	----
			2	----	39.6	58.0	2.4	.9	5.4	82.7	2.0	6.6	----	8,211	14,780	----	----	----
			3	----	40.6	59.4	----	.9	5.6	84.8	2.0	6.7	----	8,417	15,150	----	----	----
Khotan; Khotan mine, Poplar Creek bed (head of main entry, mine just developing).	88808	B	1	1.8	36.2	57.3	4.7	1.1	----	----	----	----	.9	7,750	13,950	2,680	----	----
			2	----	36.8	58.4	4.8	1.1	----	----	----	----	----	7,889	14,200	----	----	----
Lancing, 8 miles east of; Summers (drift) mine, bed not named (face of main entry, 230 feet south 30° east of mine mouth).	21148	B	1	4.3	35.2	55.9	4.6	1.3	----	----	----	----	3.3	7,778	14,000	2,360	123	----
			2	----	36.7	55.5	4.8	1.3	----	----	----	----	----	8,128	14,630	----	----	----

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Nemo, ½ mile northwest of; Taylor mine, Upper bed (head of main entry, 300 feet east of mine mouth).	32759	B	1	4.5	28.4	57.6	9.5	1.8					3.4	7,294	13,130	2,540		67
			2		29.7	60.4	9.9	1.9						7,639	13,750			
Same, Lower bed (head of east entry, 200 feet south of mine mouth).	32760	B	1	4.1	26.0	54.9	15.0	.8					2.9	6,750	12,150	3,000		
			2		27.1	57.3	15.6	.9						7,039	12,670			
3 miles from; Flat Rock No. 3 mine, Catoosa bed (face of 4 cross entry, 1 right main entry).	29556	A	1	2.3	32.8	58.5	6.4	2.2					1.6	7,844	14,120	2,330	193	
Same (1 cross entry, 3 right main entry, 700 feet northeast of mine mouth).	29557	A	1	1.9	32.8	58.2	7.1	2.6					1.3	7,822	14,080	2,230	193	
Same (face of main north entry)	29558	A	1	2.1	31.7	58.8	7.4	2.0					1.5	7,784	14,010	2,260	193	
Same (composite of samples 29556 to 29558, inclusive)	29559	A	1	2.2	32.5	58.3	7.0	2.5	5.3	78.2	1.6	5.4	1.5	7,840	14,110		193	
			2		33.3	59.5	7.2	2.6	5.2	80.0	1.7	3.3		8,017	14,430			
			3		35.8	64.2		2.8	5.6	86.2	1.8	3.6		8,633	15,540			
3½ miles southwest of; Catoosa mine, Walden Ridge bed (face of 2 room, 1 right entry, 75 feet north of mine mouth).	21428	B	1	2.9	32.2	57.6	7.3	1.3					2.2	7,722	13,900	2,430	123	
			2		33.2	59.3	7.5	1.3						7,956	14,320			
Oakdale, ½ mile south of; Bahahatchie mine (head of 1 left entry, 600 feet east of mine mouth).	32755	B	1	3.6	30.6	50.8	15.0	1.8					2.6	6,811	12,260	2,620		68
			2		31.7	52.8	15.5	1.9						7,067	12,720			
2 miles north of; Oakdale mine, Catoosa bed (head of main entry)	88809	B	1	2.0	30.7	57.6	9.7	2.8	5.0	75.8	1.4	5.3	1.6	7,589	13,660	2,340		
			2		31.3	58.8	9.9	2.8	4.8	77.3	1.4	3.8		7,739	13,930			
			3		34.7	65.3		3.1	5.4	85.8	1.6	4.1		8,589	15,460			
Oliver Springs, 1 mile west-northwest of; Reed (drift) mine, coal bed unidentified (face of 2 right entry, 800 feet north and 500 feet east of mine mouth).	21425	B	1	2.3	36.9	56.6	4.2	.7					1.0	7,917	14,250	2,300	123	
			2		37.8	57.9	4.3	.7						8,100	14,580			
1½ miles north-northwest of; Williams mine, Coal Creek bed (main entry, 100 feet west of mine mouth).	21419	B	1	2.7	37.6	54.4	5.3	1.1					1.3	7,744	13,940	2,480	123	
			2		38.7	55.9	5.4	1.1						7,967	14,340			
1½ miles west-northwest of; Levan mine, Old Eagle bed (face of butt entry, 250 feet north of mine mouth).	21420	B	1	2.5	39.1	54.9	3.5	1.4					1.0	7,956	14,320	2,290	123	
			2		40.1	56.3	3.6	1.4						8,156	14,680			
1¾ miles northwest of; Jackson mine, Coal Creek (?) bed (rib sample from main entry, 400 feet northwest of mine mouth).	21426	B	1	2.4	40.2	54.7	2.7	1.0					1.0	7,978	14,360	2,270	123	
			2		41.2	56.0	2.8	1.0						8,178	14,720			
2 miles northwest of; New Eagle No. 1 mine, Poplar Creek bed (head of main entry, 250 feet north of mine mouth).	32699	B	1	2.1	39.7	52.1	6.1	3.5	5.4	76.0	1.8	7.2	.8	7,667	13,800	2,380		68
			2		40.6	53.2	6.2	3.5	5.3	77.7	1.8	5.5		7,828	14,090			
			3		43.3	56.7		3.8	5.6	82.8	1.9	5.9		8,350	15,030			
2 miles northwest of; Union mine, Poplar Creek bed (head of short dog entry, main entry, 800 feet west of mine mouth).	32702	B	1	2.1	38.7	54.1	5.1	1.8	5.3	77.4	2.0	8.4	.5	7,774	13,940	2,230		68
			2		39.5	55.3	5.2	1.8	5.2	79.0	2.0	6.8		7,906	14,230			
			3		41.7	58.3		1.9	5.5	83.4	2.1	7.1		8,344	15,020			
2¼ miles north-northwest of; Old Mount Carbon mine, Coal Creek bed (rib, main entry, 75 feet east of mine mouth).	21421	B	1	2.5	39.4	54.9	3.2	1.2					1.1	7,950	14,310	2,200	123	
			2		40.4	56.3	3.3	1.2						8,156	14,680			
2½ miles north-northwest of; Signal Mountain mine, Coal Creek bed (face of main entry, 250 feet north of mine mouth).	21422	B	1	2.1	39.0	50.0	8.9	5.2					1.0	7,478	13,460	2,080	123	
			2		39.9	51.0	9.1	5.3						7,639	13,750			
3 miles northwest of; Richards mine, Coal Creek bed (face of main face entry).	21416	B	1	1.6	39.9	46.3	12.2	6.4					.6	7,278	13,100	2,060	123	
Same (face of main entry)	21417	B	1	1.6	40.5	51.1	6.8	4.4					.8	7,767	13,980	2,050	123	
Same (composite of samples 21416 and 21417)	21418	B	1	1.5	40.0	48.9	9.6	5.4	5.3	72.8	1.7	5.2	.7	7,522	13,540		123	
			2		40.6	49.7	9.7	5.5	5.2	73.9	1.7	4.0		7,639	13,750			
			3		45.0	55.0		6.1	5.7	81.9	1.9	4.4		8,456	15,220			
3½ miles northwest of; Prudential mine, Coal Creek bed (face of 13 left entry, 850 feet north and 2,300 feet northwest of mine mouth).	21412	B	1	1.9	39.1	48.8	10.2	4.5					1.2	7,467	13,440	2,000	123	
Same (face of 12 left entry, 800 feet north and 2,000 feet northwest of mine mouth).	21413	B	1	1.4	39.8	49.6	9.2	4.8					.5	7,628	13,730	1,990	123	
Same (face of 11 left entry, 850 feet north and 1,800 feet northwest of mine mouth).	21414	B	1	1.6	39.4	50.3	8.7	4.4					.7	7,672	13,810	2,010	123	
Same (composite of samples 21412 to 21414, inclusive)	21415	B	1	1.5	39.7	49.5	9.3	4.4	5.4	74.2	1.8	4.9	.8	7,600	13,680		123	
			2		40.3	50.3	9.4	4.5	5.3	75.3	1.8	3.7		7,717	13,890			
			3		44.5	55.5		5.0	5.8	83.2	2.0	4.0		8,517	15,330			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MORGAN COUNTY—continued																		
Oliver Springs, 3¾ miles north-northwest of; Big Mountain mine, Coal Creek bed (rib in main entry, 300 feet north of mine mouth).	21424	B	1	2.1	39.2	52.1	6.6	4.2	----	----	----	----	1.1	7,767	13,980	2,040	123	----
			2	----	40.1	53.1	6.8	4.2	----	----	----	----	----	7,928	14,270	----	----	----
4 miles north-northwest of; Poplar Creek mine, Coal Creek bed (rib in main entry, 400 feet north of mine mouth).	21423	B	1	2.0	39.0	52.0	7.0	3.9	----	----	----	----	1.0	7,700	13,860	2,040	123	----
			2	----	39.8	53.0	7.2	4.0	----	----	----	----	----	7,856	14,140	----	----	----
Petros; Big Brushy Nos. 1 and 2 mines, Brushy Mountain bed (2,500 feet southeast of mine mouth).	2958	A	1	2.3	35.4	55.4	6.9	3.0	----	----	----	----	1.3	7,694	13,850	----	22	----
			2	----	36.2	56.7	7.1	3.0	----	----	----	----	----	7,872	14,170	----	----	----
Same (face of 5 right entry, 1 main entry, entry stump, 1,000 feet south 50° east of mine mouth).	82638	A	1	2.4	37.4	54.4	5.8	2.8	----	----	----	----	1.1	7,694	13,850	2,220	----	69
Same (room pillar, 2 main entry, 3,000 feet south 15° east of mine mouth).	82639	A	1	2.0	38.2	55.6	4.2	2.1	----	----	----	----	.7	7,894	14,210	2,280	----	----
Same (entry stump, 4 right entry, 2 main entry, 3,000 feet south 15° west of mine mouth).	82640	A	1	2.1	37.4	54.4	6.1	2.8	----	----	----	----	.9	7,683	13,830	2,220	----	----
Same (chain stump, 2 main entry, 1,800 feet south of mine mouth)	82641	A	1	2.1	36.4	53.9	7.6	3.0	----	----	----	----	.8	7,550	13,590	2,240	----	----
Same (composite of samples 82638 to 82641, inclusive)	82642	A	1	2.1	37.2	54.7	6.0	2.7	5.5	76.5	1.8	7.5	.9	7,711	13,880	----	----	----
			2	----	38.0	55.9	6.1	2.7	5.3	78.2	1.9	5.8	----	7,878	14,180	----	----	----
			3	----	40.5	59.5	----	2.9	5.7	83.3	2.0	6.1	----	8,394	15,110	----	----	----
Jellico bed (main heading, 3,200 feet east of mine mouth)	32693	B	1	2.2	35.6	52.1	10.1	4.8	----	----	----	----	.8	7,239	13,030	2,520	----	69
Same (rib, 1 main entry, 14 left entry, 2,600 feet east of mine mouth)	32694	B	1	2.1	34.9	55.8	7.2	3.1	----	----	----	----	.8	7,533	13,560	2,520	----	----
Same (head of 14 left entry, 3,000 feet east of mine mouth)	32695	B	1	2.8	35.1	51.6	10.5	3.1	----	----	----	----	1.5	7,178	12,920	2,520	----	----
Same (composite of samples 32693 to 32695, inclusive)	32696	B	1	2.5	35.0	53.2	9.3	3.6	5.1	73.0	1.7	7.3	1.0	7,311	13,160	----	----	----
			2	----	35.9	54.6	9.5	3.7	5.0	74.8	1.7	5.3	----	7,500	13,500	----	----	----
			3	----	39.7	60.3	----	4.1	5.5	82.7	1.9	5.8	----	8,283	14,910	----	----	----
Same (face of 3 left entry, 2,500 feet north of mine mouth)	21089	B	1	2.3	36.4	55.0	6.3	2.6	----	----	----	----	1.1	7,689	13,840	2,330	123	----
Same (face of 4 entry, 2,500 feet north-northeast of mine mouth)	21090	B	1	2.2	36.5	53.8	7.5	2.3	----	----	----	----	1.1	7,578	13,640	2,350	123	----
Same (composite of samples 21088 to 21090, inclusive)	21091	B	1	2.3	36.4	54.2	7.1	2.5	5.4	75.6	1.9	7.5	1.0	7,600	13,680	----	123	----
			2	----	37.3	55.4	7.3	2.6	5.3	77.3	2.0	5.5	----	7,778	14,000	----	----	----
			3	----	40.2	59.8	.8	2.8	5.7	83.4	2.1	6.0	----	8,383	15,090	----	----	----
1 mile north of; State No. 3 mine, Jellico bed (face of 15 cross entry, 3,500 feet north 45° west of mine mouth).	21092	B	1	2.0	34.6	50.1	13.3	2.1	----	----	----	----	.8	7,083	12,750	2,430	123	----
Same (face of 9 cross entry, 3,800 feet north 55° west of mine mouth)	21093	B	1	2.2	36.4	53.6	7.8	2.3	----	----	----	----	1.0	7,533	13,560	2,370	123	----
Same (face of 8 cross entry, 4,500 feet south 55° east of mine mouth)	21094	B	1	2.4	37.0	54.8	5.8	3.6	----	----	----	----	1.2	7,728	13,910	2,130	123	----
Same (face of 12 cross entry, 4,400 feet east 55° east of mine mouth)	21095	B	1	2.2	37.2	55.0	5.6	2.7	----	----	----	----	1.0	7,778	14,000	2,270	123	----

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Same (composite of samples 21092 to 21095, inclusive)	21096	B	1	2.3	36.4	53.2	8.1	2.6	5.4	74.9	1.9	7.1	1.0	7,550	13,590		123	
			2		37.2	54.5	8.3	2.7	5.2	76.7	1.9	5.2		7,722	13,900			
			3		40.6	59.4		2.9	5.7	83.6	2.1	5.7		8,422	15,160			
1 mile east of; Petros No. 5 mine, Jellico bed (face of 2 right entry, 2,000 feet east-southeast of mine mouth).	21088	B	1	2.3	36.7	53.2	7.8	2.6					.9	7,539	13,570	2,430	123	
1½ miles north of; Frozen Head mine, Frozen Head bed (rib, main entry, 900 feet north of mine mouth).	21083	B	1	3.0	35.2	55.1	6.7	.9					1.3	7,511	13,520	2,580	123	
			2		36.3	56.8	6.9	.9						7,744	13,940			
Stephens, ½ mile southwest of; Little Brushy mine, Jellico bed (mouth of 12 room, 1 entry, 2,600 feet south 43° west of mine mouth).	21084	B	1	2.8	36.9	54.5	5.8	2.9					1.6	7,739	13,930	2,130	123	
Same (face of dip entry, 2,600 feet south 43° west of mine mouth)	21085	B	1	2.9	37.5	54.9	4.7	2.6					1.7	7,850	14,130	2,150	123	
Same (mouth of 4 room, main entry, new opening, 2,650 feet south 43° west of mine mouth).	21086	B	1	2.8	37.3	55.3	4.6	2.3					1.7	7,850	14,130	2,350	123	
Same (composite of samples 21084 to 21086, inclusive)	21087	B	1	2.9	37.3	54.7	5.1	2.6	5.6	77.4	1.7	7.6	1.6	7,806	14,050		123	
			2		38.4	56.3	5.3	2.7	5.5	79.7	1.8	5.0		8,033	14,460			
			3		40.5	59.5		2.9	5.8	84.1	1.9	5.3		8,478	15,260			
5 miles west of; Laymance (drift) mine, bed not named (main entry, 200 feet south of mine mouth).	21149	B	1	3.3	35.7	54.0	7.0	2.7					2.6	7,700	13,860	2,070	123	
			2		37.0	55.7	7.3	2.8						7,967	14,340			
Winslow siding; Winslow mine, Hooper bed (head of 1 right entry, 800 feet from mine mouth).	88810	B	1	2.3	36.9	57.2	3.6	.7					1.5	7,961	14,330	2,340		
			2		37.8	58.6	3.6	.7						8,150	14,670			
OVERTON COUNTY																		
Crawford; Crawford mine, Wilder bed, west side (1,000 feet from drift, 59¼-inch cut).	1617	B	1	2.7	35.4	47.6	14.3	3.3					1.1				22	
			2		36.4	48.9	14.7	3.4										
Davidson; Gooch mine, Wilder bed (head of 2 right entry, 675 feet west of mine mouth).	33445	B	1	3.6	34.8	50.4	11.2	3.1					2.1	7,050	12,690	2,220		70
Same (main head entry, 560 feet southwest of mine mouth)	33446	B	1	3.2	35.8	50.6	10.4	2.5					1.9	7,161	12,890	2,250		
Same (head 1 left entry, 600 feet from mine mouth)	33447	B	1	1.9	36.1	50.9	11.1	3.1					.7	7,200	12,960	2,310		
Same (composite of samples 33445 to 33447, inclusive)	33448	B	1	2.8	35.3	51.1	10.8	2.9	5.0	71.2	1.3	8.8	1.6	7,128	12,830			
			2		36.3	52.6	11.1	3.0	4.8	73.2	1.4	6.5		7,333	13,200			
			3		40.8	59.2		3.4	5.4	82.4	1.6	7.2		8,250	14,850			
½ mile west of; Buckeye mine, Wilder bed (head of 1 left entry, 250 feet southwest of mine mouth).	33441	B	1	3.2	35.0	51.6	10.2	3.3					1.6	7,139	12,850	2,370		70
Same (head of main entry, 250 feet north 80° west of mine mouth)	33442	B	1	3.7	35.5	51.3	9.5	3.1					2.1	7,156	12,880	2,210		
Same (near head, 1 right entry, 300 feet northwest of mine mouth)	33443	B	1	4.1	33.7	53.0	9.2	2.5					2.6	7,139	12,850	2,220		
Same (composite of samples 33441 to 33443, inclusive)	33444	B	1	3.7	34.5	52.1	9.7	2.9	5.0	71.7	1.4	9.3	2.1	7,161	12,890			
			2		35.8	54.2	10.0	3.1	4.8	74.4	1.4	6.3		7,433	13,380			
			3		39.8	60.2		3.4	5.3	82.7	1.6	7.0		8,261	14,870			
½ mile northwest of; Tunnel mine, Wilder bed (face of 40 room, 4 left entry).	33437	B	1	3.9	34.3	52.6	9.2	2.2					2.3	7,194	12,950	2,310		71
Same (head of 6 left entry, 1,750 feet inside mine mouth)	33438	B	1	4.6	33.7	52.2	9.5	3.1					3.1	7,083	12,750	2,300		
Same (head of main entry, 1,800 feet northwest of mine mouth)	33439	B	1	4.0	34.1	52.4	9.5	2.2					2.8	7,167	12,900	2,330		
Same (composite of samples 33437 to 33439, inclusive)	33440	B	1	4.2	34.4	52.0	9.4	2.5	5.0	71.4	1.4	10.3	2.7	7,139	12,850			
			2		35.9	54.3	9.8	2.6	4.7	74.6	1.5	6.8		7,450	13,410			
			3		39.8	60.2		2.9	5.2	82.7	1.6	7.6		8,261	14,870			
1½ miles southwest of; Brier Hill No. 1 mine, Wilder bed (head of aircourse, main entry, 1,300 feet south 31° west of mine mouth).	33468	B	1	3.3	35.2	52.7	8.8	2.9					1.9	7,272	13,090	2,270		71
Same (face of 5 right entry, 1 left entry, 1,000 feet north 59° west of mine mouth).	33469	B	1	2.9	35.1	53.8	8.2	2.0					1.5	7,394	13,310	2,390		
Same (composite of samples 33468 and 33469)	33470	B	1	3.0	35.2	53.3	8.5	2.4	5.1	73.5	1.4	9.1	1.7	7,328	13,190			
			2		36.3	54.9	8.8	2.5	4.9	75.8	1.5	6.5		7,556	13,600			
			3		39.8	60.2		2.8	5.3	83.1	1.6	7.2		8,278	14,900			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
OVERTON COUNTY—continued																		
Davidson, 1½ miles southwest of; Brier Hill No. 2 mine, Wilder bed (head of 4 east entry, 1 south entry, 1 east entry, 1,000 feet southeast of mine mouth).	33465	B	1	3.6	34.9	53.0	8.5	2.8	----	----	----	----	2.2	7,289	13,030	2,270	----	72
Same (head of 6 east entry, main entry, 1,100 feet southeast of mine mouth).	33466	B	1	4.2	32.6	54.0	9.2	2.6	----	----	----	----	2.7	7,172	12,910	2,270	----	----
Same (composite of samples 33465 and 33466)	33467	B	1	3.9	33.8	53.3	9.0	2.7	5.0	72.7	1.4	9.2	2.5	7,211	12,980	----	----	----
			2	----	35.1	55.6	9.3	2.8	4.8	75.6	1.4	6.1	----	7,500	13,500	----	----	----
			3	----	38.8	61.2	----	3.1	5.2	83.4	1.5	6.8	----	8,272	14,890	----	----	----
Highland Junction, 2½ miles northwest of; Overton mine, Bon Air No. 2 bed (face of main straight entry, 460 feet southwest of mine mouth).	20978	B	1	3.4	35.9	51.2	9.5	3.2	----	----	----	----	2.2	7,317	13,170	2,120	123	----
Same (face of main entry, 1,200 feet north 20° west of mine mouth)	20979	B	1	3.2	35.8	51.5	9.5	2.3	----	----	----	----	2.1	7,328	13,190	2,300	123	----
Same (in 1 left entry, 500 feet from mine mouth)	20980	B	1	3.6	35.0	49.8	11.6	3.7	----	----	----	----	2.3	7,050	12,690	2,160	123	----
Same (composite of samples 20978 to 20980, inclusive)	20981	B	1	3.4	35.6	50.6	10.4	3.1	5.3	72.3	1.4	7.5	2.2	7,217	12,990	----	123	----
			2	----	36.8	52.5	10.7	3.3	5.1	74.8	1.4	4.7	----	7,472	13,450	----	----	----
			3	----	41.3	58.7	----	3.6	5.7	83.8	1.6	5.3	----	8,372	15,070	----	----	----
Monterey (Putnam county), 7 miles east of; Peacock mine, Bon Air No. 2 bed (face of 3 right entry).	79869	A	1	3.0	39.0	48.5	9.5	2.4	----	----	----	----	1.8	7,344	13,220	2,510	----	73
Same (face of main entry)	79870	A	1	3.5	35.9	50.1	10.5	2.3	----	----	----	----	2.3	7,189	12,940	2,510	----	----
Same (face of 4 right entry)	79871	A	1	2.8	36.3	50.8	10.1	3.4	----	----	----	----	1.7	7,311	13,160	2,260	----	----
Same (composite of samples 79869 to 79871, inclusive)	79872	A	1	3.1	36.2	50.7	10.0	2.7	5.3	72.5	1.3	8.2	1.9	7,289	13,120	----	----	----
			2	----	37.3	52.4	10.3	2.8	5.2	74.8	1.3	5.6	----	7,522	13,540	----	----	----
			3	----	41.6	58.4	----	3.1	5.7	83.4	1.5	6.3	----	8,383	15,090	----	----	----
10 miles northeast of; Bills Branch mine, Bon Air No. 2 bed (head of 4 right entry, 800 feet from mine mouth).	33454	B	1	5.0	31.5	50.1	13.4	6.8	----	----	----	----	3.7	6,639	11,950	2,060	----	72
Same (head of main entry, 600 feet west of mine mouth)	33455	B	1	5.1	33.6	48.3	13.0	5.8	----	----	----	----	3.7	6,711	12,080	2,010	----	----
Same (composite of samples 33454 and 33455)	33456	B	1	5.1	32.2	49.5	13.2	6.3	4.7	65.8	1.3	8.7	3.7	6,689	12,040	----	----	----
			2	----	33.9	52.2	13.9	6.7	4.4	69.4	1.4	4.2	----	7,044	12,680	----	----	----
			3	----	39.4	60.6	----	7.7	5.1	80.5	1.6	5.1	----	8,183	14,730	----	----	----
Same (face of 1 main entry)	79884	A	1	2.6	37.1	48.6	11.7	3.4	----	----	----	----	1.4	7,111	12,800	2,180	----	72
Same (face of 4 right entry)	79885	A	1	2.5	37.3	48.1	12.1	4.6	----	----	----	----	1.4	7,094	12,770	2,090	----	----

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Same (face of 2 main entry)	79886	A	1	2.9	36.5	48.8	11.8	3.6					1.8	7,056	12,700	2,180		
Same (composite of samples 79884 to 79886, inclusive)	79887	A	1	2.6	36.9	48.6	11.9	3.9	5.2	70.1	1.3	7.6	1.5	7,083	12,750			
			2		37.9	49.9	12.2	4.0	5.0	72.0	1.3	5.5		7,272	13,090			
			3		43.2	56.8		4.5	5.7	82.0	1.5	6.3		8,283	14,910			
Obey City, ¼ mile west of; Peacock mine, Bon Air No. 2 bed (face of cross entry, 1 right entry, 1,000 feet southwest of mine mouth).	20992	B	1	2.8	36.4	50.8	10.0	3.3					1.9	7,317	13,170	2,160	123	
			2		37.5	52.2	10.3	3.4						7,528	13,550			
½ mile east of; Obey River mine, Bon Air No. 2 bed (face of cross entry, 1 left entry, 500 feet northeast of mine mouth).	20991	B	1	2.6	36.0	49.1	12.3	3.8					1.7	7,150	12,870	2,180	123	
			2		37.0	50.4	12.6	3.9						7,339	13,210			
Wilder; Wilder No. 3 mine, Wilder bed (head of 3 left entry, slope entry, 5,000 feet southeast of mine mouth).	33449	B	1	4.1	34.3	50.7	10.9	3.5					2.8	6,961	12,530	2,060		
Same (head of 2 right entry, slope entry)	33450	B	1	3.0	35.2	52.2	9.6	3.1					1.7	7,172	12,910	2,220		
Same (head of 3 left entry, 4,000 feet northwest of mine mouth)	33451	B	1	3.1	35.2	51.6	10.1	3.2					1.8	7,167	12,900	2,230		
Same (head of 8 left entry, 5,000 feet northwest of mine mouth)	33452	B	1	3.6	35.1	51.3	10.0	3.7					2.2	7,111	12,800	2,230		
Same (composite of samples 33449 to 33452, inclusive)	33453	B	1	3.6	34.9	51.4	10.1	3.4	4.9	70.7	1.4	9.5	2.1	7,117	12,810			
			2		36.2	53.3	10.5	3.5	4.7	73.3	1.4	6.6		7,383	13,290			
			3		40.5	59.5		3.9	5.2	81.8	1.6	7.5		8,244	14,840			
PUTNAM COUNTY																		
Monterey, 2 miles north of; Monterey mine, Bon Air No. 2 bed (face of main entry, 200 feet south of mine mouth).	20990	B	1	3.4	38.2	48.7	9.7	3.4					2.2	7,278	13,100	2,100	123	
			2		39.6	50.3	10.1	3.6						7,528	13,550			
RHEA COUNTY																		
Dayton, near; North Pole mine, Richland bed (main heading of Creig workings, 3,000 feet from mine mouth).	10689	B	1	1.9	29.7	54.4	14.0	1.4	4.7	71.5	1.4	7.0	.7	7,111	12,800	2,410	85	
			2		30.3	55.4	14.3	1.5	4.6	72.9	1.4	5.3		7,250	13,050			
			3		35.3	64.7		1.7	5.4	85.1	1.7	6.1		8,456	15,220			
Same (face of room, 5 left heading, Creig workings, 2,600 feet from mine mouth).	10690	B	1	1.9	29.7	53.4	15.0	1.7	4.7	71.1	1.4	6.1	.7	7,044	12,680	2,370	85	
			2		30.3	54.4	15.3	1.7	4.6	72.5	1.4	4.5		7,178	12,920			
			3		35.7	64.3		2.0	5.4	85.5	1.7	5.4		8,472	15,250			
Same (face of 8 left heading, 3,000 feet from mine mouth)	10692	B	1	2.0	28.8	57.4	11.8	1.8	4.9	74.4	1.3	5.8	.9	7,344	13,220	2,250	85	
			2		29.4	58.6	12.0	1.8	4.7	75.9	1.3	4.3		7,489	13,480			
			3		33.4	66.6		2.1	5.4	86.3	1.5	4.7		8,517	15,330			
Same (face of 7 right heading, between 2,700 and 2,800 feet from mine mouth).	10693	B	1	2.1	27.9	55.1	14.9	.7	4.8	71.5	1.2	6.9	1.0	7,017	12,630	2,480	85	
			2		28.5	56.3	15.2	.7	4.6	73.0	1.2	5.3		7,167	12,900			
			3		33.6	66.4		.8	5.5	86.1	1.4	6.2		8,456	15,220			
New Prospect mine, Nelson bed (face of room, 3 left heading, 1,200 feet from mine mouth).	10696	B	1	1.8	27.9	49.5	20.8	.5	4.5	66.2	1.2	6.8	.8	6,483	11,670	2,460	85	
			2		28.4	50.4	21.2	.5	4.4	67.4	1.2	5.3		6,600	11,880			
			3		36.0	64.0		.6	5.6	85.6	1.5	6.7		8,372	15,070			
Same (face of room, 2 left heading)	10697	B	1	3.1	29.8	52.7	14.4	.5					2.0			2,610	85	
			2		30.7	54.4	14.9	.5										
Same (end of 3 right heading)	10698	B	1	1.9	27.9	49.2	21.0	.5					.8			2,660	85	
			2		28.4	50.1	21.5	.5										
Same (main heading, 1,500 to 1,600 feet from mine mouth)	10699	B	1	4.3	28.2	51.9	15.6	.5					3.2			2,690	85	
			2		29.5	54.2	16.3	.5										
Graysville, 2 miles north of; Montague No. 6 mine, Nelson bed (face of 1 room, main entry, 400 feet west of mine mouth).	22158	B	1	2.9	25.5	46.4	25.2	.6					1.8	5,961	10,730	2,280	123	
			2		26.3	47.7	26.0	.6						6,133	11,040			
2⅛ miles north of; Montague No. 1 mine, Nelson bed (aircourse pillar, 2 haulageway, 1 main entry).	22159	B	1	2.0	33.4	57.0	7.6	3.7					1.1	7,672	13,810	2,010	123	
			2		34.1	58.1	7.8	3.8						7,828	14,090			
Same (chain pillar, main entry)	22165	B	1	2.1	29.4	53.0	15.5	.7					1.2	6,983	12,570	2,290	123	
			2		30.0	54.2	15.8	.7						7,133	12,840			
2½ miles north of; Montague No. 5-A mine, Sewanee bed (face of 2 right entry, 1,600 feet east of mine mouth).	22181	B	1	4.2	30.0	55.0	10.8	.8					2.9	7,206	12,970	2,470	123	
Same (face of 2 left entry, 1,200 feet north of mine mouth)	22182	B	1	2.5	31.5	53.7	12.3	2.0					1.2	7,167	12,900	2,070	123	

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, ° F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
RHEA COUNTY—continued																		
Graysville, 2½ miles north of; Montague No. 5-B mine, Sewanee bed (pillar 1 right entry, 600 feet south of mine mouth).	22183	B	1	2.5	30.8	56.6	10.1	1.3	-----	-----	-----	-----	1.2	7,400	13,320	2,350	123	-----
Same (composite of samples 22180 to 22183, inclusive)	22184	B	1	3.0	30.2	55.0	11.8	1.3	4.9	73.0	1.4	7.6	1.6	7,200	12,960	-----	123	-----
			2	-----	31.1	56.7	12.2	1.3	4.7	75.2	1.4	5.2	-----	7,422	13,360	-----	-----	-----
			3	-----	35.4	64.6	-----	1.5	5.4	85.6	1.6	5.9	-----	8,450	15,210	-----	-----	-----
3 miles north of; Montague No. 3 mine, Sewanee bed (face of 8 right entry, 3,200 feet north 22° east, and 500 feet south 70° east of mine mouth).	22180	B	1	2.5	28.8	54.3	14.4	.9	-----	-----	-----	-----	1.3	7,006	12,610	2,710	123	-----
ROANE COUNTY																		
DeArmond; Wilcox mine, Rockwood bed (head of west entry, 1,400 feet southwest of mine mouth).	32754	B	1	4.7	31.1	56.0	8.2	.6	-----	-----	-----	-----	2.9	7,250	13,050	2,140	-----	73
			2	-----	32.7	58.7	8.6	.7	-----	-----	-----	-----	-----	7,606	13,690	-----	-----	-----
Emory Gap, ½ mile north of; Emory Gap mine, Rockwood bed (head of west entry, 400 feet from mine mouth).	32752	B	1	4.9	32.0	54.7	8.4	.5	5.0	73.1	1.4	11.6	2.9	7,139	12,850	2,090	-----	73
			2	-----	33.6	57.6	8.8	.6	4.7	76.9	1.5	7.5	-----	7,506	13,510	-----	-----	-----
			3	-----	36.9	63.1	-----	.6	5.2	84.3	1.6	8.3	-----	8,233	14,820	-----	-----	-----
Harriman, 2 miles northeast of; Walden Ridge mine, Walden Ridge bed (face of 1 room, 1 right entry, 300 feet north of mine mouth).	21082	B	1	4.3	33.1	54.1	8.5	.5	-----	-----	-----	-----	2.7	7,311	13,160	2,730	123	-----
			2	-----	34.6	56.5	8.9	.5	-----	-----	-----	-----	-----	7,617	13,710	-----	-----	-----
3 miles east of; Blizzard mine, Rockwood bed (head of west entry, 600 feet west of mine mouth)	32753	B	1	4.4	32.1	57.0	6.5	.5	-----	-----	-----	-----	2.3	7,378	13,280	2,440	-----	74
			2	-----	33.5	59.7	6.8	.5	-----	-----	-----	-----	-----	7,722	13,900	-----	-----	-----
McLean siding, ¾ mile south of; McLean mine, Sewanee bed (face of Sam Day's place, 3,000 feet north 70° west of mine mouth).	21023	B	1	1.5	28.2	47.2	23.1	2.0	-----	-----	-----	-----	.7	6,350	11,430	-----	123	-----
Same (face of Hartberger's place, 700 feet northwest of mine mouth)	21024	B	1	3.0	29.4	58.1	9.5	.8	-----	-----	-----	-----	1.9	7,406	13,330	2,400	123	-----
Same (composite of samples 21023 and 21024)	21025	B	1	2.3	28.7	52.7	16.3	1.4	4.7	69.8	1.3	6.5	1.3	6,889	12,400	-----	123	-----
			2	-----	29.4	53.9	16.7	1.4	4.6	71.4	1.3	4.6	-----	7,044	12,680	-----	-----	-----
			3	-----	35.4	64.6	-----	1.7	5.5	85.7	1.6	5.5	-----	8,456	15,220	-----	-----	-----
¾ mile west of; Rockwood mine, Sewanee bed (face of 1 dip entry, 9 entry).	18695	A	1	1.4	30.4	59.1	9.1	.5	-----	-----	-----	-----	.5	7,622	13,720	2,340	123	-----
Same (face of incline, 6 entry)	18696	A	1	1.4	29.2	60.4	9.0	.5	-----	-----	-----	-----	.5	7,628	13,730	2,260	123	-----
Same (face of 2 entry)	18697	A	1	1.6	28.8	58.6	11.0	.6	-----	-----	-----	-----	.7	7,461	13,430	2,300	123	-----
Same (composite of samples 18695 to 18697, inclusive)	18698	A	1	1.5	29.5	59.3	9.7	.6	4.7	77.4	1.3	6.3	.5	7,567	13,620	-----	123	-----
			2	-----	29.9	60.3	9.8	.6	4.6	78.6	1.3	5.1	-----	7,683	13,830	-----	-----	-----
			3	-----	33.2	66.8	-----	.6	5.1	87.2	1.5	5.6	-----	8,517	15,330	-----	-----	-----

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Same (Bill Mahorn's place, 2 entry, 10,500 feet northwest of mine mouth).	21015	B	1	8.7	22.9	49.4	19.0	.6	-----	-----	-----	-----	8.0	6,100	10,980	-----	123	----
Same (Lee McNeil's place, 6 entry, 10,500 feet north 20° west of mine mouth).	21016	B	1	1.7	29.3	60.1	8.9	.5	-----	-----	-----	-----	.9	7,633	13,740	2,430	123	----
Same (John Long's place, 9 entry, 11,500 feet north 15° east of mine mouth).	21017	B	1	1.6	29.1	60.1	9.2	.5	-----	-----	-----	-----	.7	7,583	13,650	2,250	123	----
Same (W. T. Acuff's place, 10 entry, 6,500 feet north of mine mouth)	21018	B	1	2.2	29.5	59.5	8.8	.5	-----	-----	-----	-----	1.2	7,567	13,620	2,480	123	----
Same (composite of samples 21015 to 21018, inclusive)	21019	B	1	3.6	27.7	57.0	11.7	.5	5.0	73.7	1.2	7.9	2.7	7,200	12,960	-----	123	----
			2	-----	28.7	59.1	12.2	.5	4.7	76.5	1.3	4.8	-----	7,472	13,450	-----	----	----
			3	-----	32.7	67.3	-----	.6	5.4	87.1	1.5	5.4	-----	8,506	15,310	-----	----	----
SCOTT COUNTY																		
Bear Creek Junction, 2 miles north of; Phillips mine, No. 4 bed (face of 17 room, 2 right entry, 600 feet west and 1,100 feet north of mine mouth).	21154	B	1	3.7	37.9	50.9	7.5	1.9	-----	-----	-----	-----	1.8	7,367	13,260	2,590	123	----
Same (mouth of 6 right entry, 1 main entry, 1,800 feet west of mine mouth).	21155	B	1	3.8	39.3	51.2	5.7	2.0	-----	-----	-----	-----	1.8	7,539	13,570	2,190	123	----
Same (composite of samples 21154 and 21155)	21156	B	1	3.8	38.5	51.2	6.5	1.9	5.6	74.3	1.8	9.9	1.8	7,444	13,400	-----	123	----
			2	-----	40.0	53.2	6.8	2.0	5.4	77.2	1.9	6.7	-----	7,739	13,930	-----	----	----
			3	-----	42.9	57.1	-----	2.2	5.8	82.8	2.0	7.2	-----	8,300	14,940	-----	----	----
2½ miles west of; Wilson mine, No. 4 bed (face of 7 room, 4 south entry, 200 feet west and 600 feet south of mine mouth).	21219	B	1	3.8	39.5	48.6	8.1	4.3	-----	-----	-----	-----	2.2	7,311	13,160	2,060	123	----
Same (face of 10 room, 1 north entry, 700 feet north of mine mouth)	21220	B	1	3.6	39.7	44.6	12.1	6.0	-----	-----	-----	-----	2.2	6,967	12,540	2,050	123	----
Same (composite of samples 21219 and 21220)	21221	B	1	3.6	39.6	46.7	10.1	5.1	5.4	70.1	1.6	7.7	2.2	7,150	12,870	-----	123	----
			2	-----	41.1	48.4	10.5	5.3	5.2	72.7	1.7	4.6	-----	7,417	13,350	-----	----	----
			3	-----	45.9	54.1	-----	5.9	5.8	81.2	1.9	5.2	-----	8,289	14,920	-----	----	----
Helenwood, ½ mile east of; Helenwood mine, Glen Mary bed (head of 1 right entry, 1 entry, 400 feet east of mine mouth).	32740	B	1	4.3	38.1	50.8	6.8	4.4	-----	-----	-----	-----	2.4	7,328	13,190	2,330	----	74
Same (head of main entry, 1 main entry, 450 feet east of mine mouth)	32741	B	1	5.3	36.8	48.3	9.6	4.4	-----	-----	-----	-----	3.5	7,028	12,650	2,200	----	----
Same (composite of samples 32740 and 32741, inclusive)	32742	B	1	4.7	37.3	49.8	8.2	4.4	5.3	71.5	1.5	9.1	3.0	7,183	12,930	-----	----	----
			2	-----	39.1	52.3	8.6	4.6	5.0	75.0	1.6	5.2	-----	7,539	13,570	-----	----	----
			3	-----	42.8	57.2	-----	5.0	5.4	82.1	1.7	5.8	-----	8,250	14,850	-----	----	----
1 mile north of; Stonecipher (wagon) mine, Glen Mary bed (head of main entry, 250 feet west of mine mouth).	32749	B	1	5.2	33.3	48.6	12.9	3.9	-----	-----	-----	-----	2.9	6,689	12,040	2,300	----	74
			2	-----	35.1	51.3	13.6	4.1	-----	-----	-----	-----	-----	7,050	12,690	-----	----	----
1½ miles northeast of; Buffalo Creek mine, Glen Mary bed (head of 1 left entry, 800 feet from mine mouth).	88820	B	1	2.7	39.3	50.0	8.0	3.6	-----	-----	-----	-----	1.9	7,433	13,380	2,280	----	----
Same (head of 2 left entry, 700 feet from mine mouth)	88821	B	1	3.3	39.5	49.8	7.4	3.4	-----	-----	-----	-----	2.5	7,444	13,400	2,450	----	----
Same (composite of samples 88820 and 88821)	88822	B	1	3.1	39.4	49.9	7.6	3.5	5.5	73.1	1.6	8.7	2.2	7,461	13,430	-----	----	----
			2	-----	40.7	51.4	7.9	3.6	5.3	75.5	1.7	6.0	-----	7,694	13,850	-----	----	----
			3	-----	44.2	55.8	-----	3.9	5.7	81.9	1.8	6.7	-----	8,356	15,040	-----	----	----
1⅛ miles northeast of; Keene & Strunk mine, Glen Mary bed (head of main entry, 1,800 feet from mine mouth).	88824	B	1	2.9	40.0	50.7	6.4	3.1	-----	-----	-----	-----	2.1	7,550	13,590	2,450	----	----
Same (head of 1 right entry, 1,700 feet from mine mouth)	88825	B	1	3.7	37.0	54.4	4.9	1.5	-----	-----	-----	-----	2.8	7,606	13,690	2,510	----	----
Same (composite of samples 88824 and 88825)	88826	B	1	3.3	38.2	52.9	5.6	2.4	5.5	75.3	1.7	9.5	2.5	7,561	13,610	-----	----	----
			2	-----	39.5	54.7	5.8	2.5	5.3	77.9	1.8	6.7	-----	7,822	14,080	-----	----	----
			3	-----	41.9	58.1	-----	2.6	5.7	82.7	1.9	7.1	-----	8,306	14,950	-----	----	----
3 miles east of; Flat Creek strip mine, Glen Mary bed (center of stripped area).	32750	B	1	1.5	34.0	56.2	8.3	3.5	5.1	75.6	1.6	5.9	.2	7,661	13,790	2,220	----	74
			2	-----	34.5	57.0	8.5	3.5	5.0	76.7	1.7	4.6	-----	7,778	14,000	-----	----	----
			3	-----	37.7	62.3	-----	3.9	5.4	83.8	1.8	5.1	-----	8,494	15,290	-----	----	----
Huntsville, 1½ miles northeast of; Cross (wagon) mine (face of main entry, 100 feet northwest of mine mouth).	21222	B	1	4.6	38.0	48.8	8.6	3.6	-----	-----	-----	-----	3.4	7,294	13,130	2,050	123	----
			2	-----	39.8	51.1	9.1	3.8	-----	-----	-----	-----	-----	7,644	13,760	-----	----	----
Jakes Tank, ¼ mile west of; Jakes Branch mine (rib sample, 300 feet from mouth of 2 right entry).	21226	B	1	3.9	36.7	54.8	4.6	.8	-----	-----	-----	-----	2.3	7,717	13,890	2,680	123	----
			2	-----	38.2	57.0	4.8	.8	-----	-----	-----	-----	-----	8,033	14,460	-----	----	----

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
SCOTT COUNTY—continued																		
Jakes Tank, ½ mile south of; Opossum Jaw mine (face of 2 right room, main entry, 100 feet south-southwest of mine mouth).	21223	B	1	3.6	39.3	49.1	8.0	3.3	----	----	----	----	2.4	7,467	13,440	2,050	123	----
			2	----	40.8	50.9	8.3	3.5	----	----	----	----		7,744	13,940			----
Newland; Arch Mountain mine, Jellico bed (face of 2 left entry, 300 feet southwest, 270 feet northwest and 140 feet southwest of mine mouth).	21272	B	1	2.9	36.1	55.6	5.4	1.9	5.6	77.1	2.0	8.0	1.8	7,689	13,840	2,430	123	----
			2	----	37.2	57.2	5.6	1.9	5.4	79.4	2.1	5.6	----	7,917	14,250	----	----	----
			3	----	39.4	60.6	----	2.0	5.8	84.1	2.2	5.9	----	8,389	15,100	----	----	----
Arch Mountain No. 2 mine, Big Mary bed (face of 10 room, 1 left entry, 1,600 feet west of mine mouth).	32795	B	1	3.4	37.2	51.0	8.4	2.6	----	----	----	----	1.9	7,300	13,140	2,460	----	75
Same (face of 7 left room, 1 left entry, 1,500 feet west of mine mouth).	32796	B	1	2.8	37.6	49.9	9.7	2.7	----	----	----	----	1.3	7,200	12,960	2,520	----	----
Same (composite of samples 32795 and 32796)	32797	B	1	3.1	37.7	50.3	8.9	2.7	5.2	72.6	1.6	9.0	1.6	7,256	13,060	----	----	----
			2	----	38.9	51.9	9.2	2.8	5.0	74.9	1.6	6.5	----	7,489	13,480	----	----	----
			3	----	42.8	57.2	----	3.1	5.6	82.5	1.8	7.0	----	8,250	14,850	----	----	----
Pemberton & Hibble No. 1 mine, Jellico bed (head of main entry, 700 feet west of mine mouth).	32788	B	1	3.8	34.3	54.5	7.4	1.7	----	----	----	----	1.9	7,339	13,210	2,410	----	75
			2	----	35.7	56.6	7.7	1.8	----	----	----	----		7,622	13,720	----	----	----
Norma, 2 miles northeast of; Roach Creek mine, Big Mary bed (head of main entry, mine just developing).	88812	B	1	2.6	36.8	53.3	7.3	2.8	----	----	----	----	1.8	7,444	13,400	2,450	----	----
			2	----	37.8	54.7	7.5	2.8	----	----	----	----		7,639	13,750	----	----	----
Oneida, 3 miles south of; Tunnelhill mine, Glen Mary bed (near head of main entry, 500 feet from mine mouth).	88827	B	1	3.9	36.4	53.1	6.6	2.3	5.4	74.4	1.7	9.6	2.9	7,439	13,390	2,450	----	----
			2	----	37.8	55.3	6.9	2.3	5.2	77.4	1.8	6.4	----	7,739	13,930	----	----	----
			3	----	40.7	59.3	----	2.5	5.6	83.1	2.0	6.8	----	8,311	14,960	----	----	----
3½ miles southeast of; Fogal or Old Stanley No. 5 mine, No. 4 or Paint Rock bed (face of 1 left entry, 650 feet northeast of mine mouth).	82649	A	1	3.2	35.4	57.0	4.4	.5	----	----	----	----	1.6	7,739	13,930	2,850	----	75
Same (rib near face of main entry, 600 feet southeast of mine mouth).	82650	A	1	3.6	35.2	56.8	4.4	1.0	----	----	----	----	2.0	7,694	13,850	2,450	----	----
Same (rib at face of 1 right entry, 600 feet southeast of mine mouth).	82651	A	1	3.0	35.9	57.8	3.3	.6	----	----	----	----	1.5	7,822	14,080	2,620	----	----
Same (composite of samples 82649 to 82651, inclusive)	82652	A	1	3.3	35.4	57.3	4.0	.7	5.6	78.1	1.9	9.7	1.7	7,739	13,930	----	----	----
			2	----	36.6	59.3	4.1	.7	5.4	80.7	1.9	7.2	----	8,000	14,400	----	----	----
			3	----	38.1	61.9	----	.7	5.7	84.1	2.0	7.5	----	8,344	15,020	----	----	----
Robbins, 2,000 yards southeast of; Southern Clay No. 5 mine, Glen Mary bed (head of main entry, 800 feet southeast of mine mouth).	32757	B	1	4.2	37.1	48.7	10.0	5.1	5.2	69.8	1.6	8.3	2.4	7,089	12,760	2,060	----	76
			2	----	38.7	50.9	10.4	5.4	4.9	72.9	1.6	4.8	----	7,400	13,320	----	----	----
			3	----	43.2	56.8	----	6.0	5.5	81.3	1.8	5.4	----	8,261	14,870	----	----	----
½ mile south of; Hughett mine, Blue Gem (?) bed (face of main entry, 300 feet east of mine mouth).	21229	B	1	3.1	38.2	54.6	4.1	1.1	----	----	----	----	1.2	7,828	14,060	2,580	123	----
			2	----	39.4	56.4	4.2	1.1	----	----	----	----		8,083	14,550	----	----	----
1 mile south of; Clay No. 1 mine (face of main entry, 1,000 feet south of mine mouth).	21228	B	1	2.7	39.7	48.4	9.2	3.8	----	----	----	----	1.2	7,406	13,330	1,990	123	----
			2	----	40.8	49.7	9.5	3.9	----	----	----	----		7,606	13,690	----	----	----

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3 miles west of; Thomas Hall mine, Glen Mary bed (face of 2 left room, main entry, No. 2 opening).	88823	B	1	3.2	35.2	56.6	5.0	.8	5.5	77.6	1.9	9.2	2.4	7,694	13,850	2,510		
			2		36.4	58.4	5.2	.8	5.3	80.2	1.9	6.6		7,950	14,310			
			3		38.4	61.6		.9	5.6	84.6	2.1	6.8		8,389	15,100			
Tennessee Blue Gem mine, Glen Mary bed (head of main entry, mine just developing).	88841	B	1	5.1	34.5	56.8	3.6	.7					4.1	7,606	13,690	2,620		
Same (face of 3 room, main entry)	88842	B	1	3.6	36.2	57.1	3.1	.9					2.7	7,789	14,020	2,510		
Same (composite of samples 88841 and 88842)	88843	B	1	4.3	35.1	57.2	3.4	.9	5.6	77.0	2.0	11.1	3.4	7,678	13,820			
			2		36.7	59.7	3.6	.9	5.3	80.5	2.0	7.7		8,028	14,450			
			3		38.0	62.0		1.0	5.5	83.5	2.1	7.9		8,322	14,980			
6 miles southeast of; Long prospect (face of main entry, 20 feet north of mine mouth).	21316	B	1	4.3	36.4	55.2	4.1	1.2					2.8	7,706	13,870	2,210	123	
			2		38.0	57.7	4.3	1.3						8,050	14,490			
6 miles south-southeast of; Newman prospect (face of main entry, 200 feet south of mine mouth).	21315	B	1	3.6	35.3	55.6	5.5	1.0					2.3	7,711	13,880	2,500	123	
			2		36.7	57.6	5.7	1.1						8,000	14,400			
8 miles southeast of; Hughett mine, Mud Slip bed (face of main entry, 25 feet west of mine mouth).	21314	B	1	3.8	36.2	55.9	4.1	.9					2.4	7,844	14,120	2,640	123	
			2		37.6	58.2	4.2	.9						8,156	14,680			
Smokey; Lindsay mine, Jellico bed (head of 1 left entry)	88813	B	1	2.4	35.9	56.4	5.3	1.7					1.4	7,700	13,860	2,620		
Same (main entry, 200 feet from mine mouth)	88814	B	1	3.6	34.9	57.0	4.5	1.8					2.5	7,600	13,680	2,570		
Same (face of 1 left entry, airway)	88815	B	1	2.7	34.9	58.1	4.3	1.9					1.7	7,739	13,930	2,450		
Same (composite of samples 88813 to 88815, inclusive)	88816	B	1	2.8	35.2	57.2	4.8	1.8	5.4	76.9	2.0	9.1	1.9	7,689	13,840			
			2		36.3	58.8	4.9	1.9	5.2	79.1	2.0	6.9		7,911	14,240			
			3		38.1	61.9		2.0	5.5	83.2	2.1	7.2		8,322	14,980			
½ mile south of; Chambers mine, State bed (right rib of main entry, 125 feet from mine mouth).	79921	A	1	2.3	37.0	55.4	5.3	2.2					.8	7,706	13,870	2,480		76
Same (face of 1 room, main entry)	79922	A	1	2.4	36.7	55.1	5.8	2.1					.9	7,656	13,780	2,480		
Same (composite of samples 79921 and 79922)	79923	A	1	2.2	36.8	55.6	5.4	2.1	5.4	77.0	1.9	8.2	.8	7,689	13,840			
			2		37.6	56.8	5.6	2.2	5.3	78.7	2.0	6.2		7,861	14,150			
			3		39.9	60.1		2.3	5.6	83.4	2.1	6.6		8,328	14,990			
1 mile south of; Workman & Jeffers mine, State bed (right rib of main entry, 200 feet outby face).	79881	A	1	3.0	36.7	54.6	5.7	1.6					1.8	7,650	13,770	2,470		77
Same (face of 1 room, main entry)	79882	A	1	2.2	37.6	56.5	3.7	2.0					.6	7,867	14,160	2,260		
Same (composite of samples 79881 and 79882)	79883	A	1	2.5	36.9	55.9	4.7	1.8	5.5	77.3	1.9	8.8	1.2	7,744	13,940			
			2		37.9	57.3	4.8	1.8	5.3	79.3	2.0	6.8		7,944	14,300			
			3		39.8	60.2		1.9	5.6	83.3	2.1	7.1		8,350	15,030			
1½ miles southwest of; McGill Bros. mine, State (?) bed (at neck of 1 room, 75 feet outby face of main entry).	79924	A	1	3.6	36.5	54.8	5.1	1.7					2.0	7,611	13,700	2,440		77
Same (50 feet from face of main entry)	79925	A	1	3.4	37.0	55.3	4.3	2.2					1.9	7,700	13,860	2,260		
Same (composite of samples 79924 and 79925)	79926	A	1	3.4	36.9	55.1	4.6	2.0	5.6	77.0	1.8	9.0	2.0	7,656	13,780			
			2		38.2	57.0	4.8	2.1	5.4	79.7	1.9	6.1		7,922	14,260			
			3		40.1	59.9		2.2	5.6	83.7	1.9	6.6		8,322	14,980			
1¼ to 4 miles northwest of; Haywood prospect opening, Lower Pioneer bed (at face of prospect, 15 feet from opening).	79877	A	1	4.2	36.2	55.0	4.6	1.3					2.7	7,517	13,530	2,510		78
Same, Upper Pioneer bed (face of prospect, 15 feet from opening)	79878	A	1	4.4	34.1	51.4	10.1	.8					2.9	7,006	12,610			
Same, Blue Gem (?) bed (face of prospect, 25 feet from opening)	79879	A	1	3.5	36.0	53.0	7.5	3.7					2.5	7,300	13,140	2,240		
Same (composite of samples 79877 to 79879, inclusive)	79880	A	1	4.2	35.1	53.3	7.4	1.8	5.3	72.9	1.7	10.9	2.7	7,294	13,130			
			2		36.6	55.6	7.8	1.9	5.1	76.1	1.8	7.3		7,611	13,700			
			3		39.7	60.3		2.1	5.5	82.5	1.9	8.0		8,256	14,860			
Stanley Junction, 1,000 feet east of; Sexton mine, Paint Rock bed (face of main entry, 200 feet northeast of mine mouth).	21224	B	1	4.2	36.5	55.0	4.3	.7					2.7	7,678	13,820	2,580	123	
			2		38.2	57.3	4.5	.7						8,022	14,440			
Same (head of 1 right cross entry, 600 feet northwest of mine mouth)	32792	B	1	4.9	33.7	56.7	4.7	.5					3.0	7,500	13,500	2,330		79
Same (head of 1 left cross entry, 500 feet southwest of mine mouth)	32793	B	1	7.5	31.6	58.0	2.9	.6					5.8	7,478	13,460	2,350		
Same (composite of samples 32792 and 32793)	32794	B	1	6.2	32.8	57.2	3.8	.6	5.5	76.7	1.7	11.7	4.4	7,494	13,490			
			2		35.0	60.9	4.1	.6	5.1	81.8	1.8	6.6		7,989	14,380			
			3		36.4	63.6		.6	5.3	85.2	1.9	7.0		8,328	14,990			

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TABLE 2.—*Chemical analyses of mine samples*—Continued

Locality, mine, etc.	Sample			Proximate				Ultimate					Air drying loss	Calorific value		Softening temperature, °F.	Reference	
	Laboratory No.	Kind	Condition	Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	Hydrogen	Carbon	Nitrogen	Oxygen		Calories	British thermal units		Bulletin No.	Page in this report
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
SCOTT COUNTY—continued																		
Stanley Junction, 1,000 feet south of; Paint Rock mine, Paint Rock bed (head of main entry, 500 feet southeast of mine mouth).	32790	B	1	4.9	34.2	57.6	3.3	0.7	-----	-----	-----	-----	2.4	7,661	13,790	2,360	----	79
			2	-----	35.9	60.7	3.4	.7	-----	-----	-----	-----		8,056	14,500	-----	----	----
Terry-West No. 5 mine, Paint Rock bed (head of south opening, 1,000 feet east of mine mouth).	32787	B	1	5.1	32.4	56.3	6.2	.7	-----	-----	-----	-----	3.1	7,372	13,270	2,610	----	79
			2	-----	34.1	59.4	6.5	.7	-----	-----	-----	-----		7,767	13,980	-----	----	----
1,000 feet northwest of; Keaton Bros. mine, Paint Rock bed (main entry, 200 feet south-southwest of mine mouth).	21227	B	1	4.1	37.0	54.6	4.3	.8	-----	-----	-----	-----	2.4	7,711	13,880	2,580	123	----
			2	-----	38.6	57.0	4.4	.8	-----	-----	-----	-----		8,039	14,470	-----	----	----
1,000 feet northwest of; Morning Glory mine (Keaton opening), Paint Rock bed (at face, 500 feet north of mine mouth).	32791	B	1	5.4	33.1	57.2	4.3	.7	5.4	76.3	1.8	11.5	3.4	7,467	13,440	2,320	----	79
			2	-----	35.0	60.4	4.6	.8	5.1	80.7	1.8	7.0	----	7,889	14,200	-----	----	----
			3	-----	36.7	63.3	-----	.8	5.3	84.5	2.0	7.4	----	8,272	14,890	-----	----	----
¼ mile southwest of; Pumpkin Hollow mine, Paint Rock bed (main entry, 250 feet west of mine mouth).	21225	B	1	3.6	37.1	54.4	4.9	.8	-----	-----	-----	-----	1.9	7,700	13,860	2,600	123	----
			2	-----	38.5	56.4	5.1	.8	-----	-----	-----	-----	----	7,989	14,380	-----	----	----
SEQUATCHIE COUNTY																		
Dunlap, 2 miles west of; Douglas No. 2 mine, Sewanee bed (face of 9 north entry, 22 west entry, 4,500 feet north 9° 34′ west, 2,350 feet south 19° 21′ west, and 1,600 feet north 39° 34′ west of mine mouth).	22239	B	1	2.6	29.8	58.9	8.7	1.1	-----	-----	-----	-----	1.4	7,522	13,540	2,460	123	----
Same (face of 6 north entry, 22 west entry, 4,500 feet north 9° 34′ west, 1,675 feet south 19° 21′ west, and 1,800 feet north 9° 34′ west of mine mouth).	22240	B	1	2.9	30.1	57.1	9.9	1.2	-----	-----	-----	-----	1.7	7,444	13,400	2,330	123	----
Same (face of 32 room, 10 north entry, 22 west entry, 4,500 feet north 9° 34′ west, 2,400 feet south 19° 21′ west, and 1,300 feet north 9° 34′ west of mine mouth).	22241	B	1	2.7	29.4	56.9	11.0	1.6	-----	-----	-----	-----	1.5	7,317	13,170	2,360	123	----
Same (composite of samples 22239 to 22241, inclusive)	22242	B	1	2.8	29.6	57.8	9.8	1.3	5.0	75.5	1.4	7.0	1.5	7,428	13,370	-----	123	----
			2	-----	30.4	59.5	10.1	1.3	4.8	77.7	1.5	4.6	----	7,639	13,750	-----	----	----
			3	-----	33.8	66.2	-----	1.5	5.3	86.4	1.7	5.1	----	8,494	15,290	-----	----	----
WHITE COUNTY																		
Bon Air, 1¾ miles south of; Bon Air mine, Bon Air (lower) bed (face of main airway, 2,020 feet south 41° east of shaft).	22365	B	1	3.0	38.1	51.1	7.8	2.7	-----	-----	-----	-----	1.6	7,489	13,480	2,340	123	----
Same (face of 2 east entry, 200 feet south 41° east, and 900 feet southwest of shaft).	22366	B	1	3.5	37.7	51.9	6.9	2.6	-----	-----	-----	-----	2.0	7,511	13,520	2,420	123	----

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Same (face of main west entry, 1,030 feet north 41° west, and 400 feet north 13° west of shaft).	22367	B	1	2.9	38.3	50.6	8.2	3.0	-----	------	-----	------	1.5	7,417	13,350	2,300	123	----
Same (composite of samples 22365 to 22367, inclusive)	22368	B	1	3.2	38.3	50.9	7.6	2.8	5.5	74.5	1.2	8.4	1.7	7,459	13,420	------	123	----
			2	-----	39.6	52.5	7.9	2.9	5.3	76.9	1.2	5.8	-----	7,694	13,850	------	----	----
			3	-----	42.9	57.1	------	3.1	5.7	83.4	1.3	6.5	-----	8,350	15,030	------	----	----
Same (rib, 3 east entry, 200 feet from main entry, or 592 feet south 41° east, and 185 feet north 49° east of shaft).	22369	B	1	2.7	39.8	47.5	10.0	3.4	-----	------	-----	------	1.4	7,356	13,240	------	123	----
			2	-----	40.9	48.8	10.3	3.6	-----	------	-----	------	-----	7,561	13,610	------	----	----
Clifty; Clifty No. 1 mine, Sewanee bed (2,100 feet north of drift mouth, 36¼-inch cut).	3005	B	1	3.0	34.7	51.5	10.8	3.4	-----	------	-----	------	1.9	7,278	13,100	------	22	----
			2	-----	35.8	53.1	11.1	3.5	-----	------	-----	------	-----	7,506	13,510	------	----	----
¼ mile east of; Clifty No. 1 mine, Sewanee (?) bed (face of 1 west entry, 3,450 feet north 5° west, 3,225 feet north 86° west, and 3,150 feet west of mine mouth).	22388	B	1	4.0	35.8	48.5	11.7	3.9	-----	------	-----	------	2.8	7,089	12,760	1,990	123	----
Same (face of 3 west entry, 3,450 feet north 5° west, 3,225 feet north 86° west, 1,750 feet north, and 1,950 feet west of mine mouth).	22389	B	1	2.5	37.7	49.1	10.7	3.5	-----	------	-----	------	1.1	7,339	13,210	2,030	123	----
Same (face of 3 main aircourse, 3,450 feet north 5° west, 3,225 feet north 86° west, 2,150 feet west, and 1,050 feet north of mine mouth).	22390	B	1	5.6	35.4	47.5	11.5	4.4	-----	------	-----	------	4.4	6,967	12,540	2,080	123	----
Same (face of 3 west entry, 3,450 feet north 5° west, 3,225 feet north 86° west, 2,150 feet west, 425 feet north, and 280 feet west of mine mouth).	22391	B	1	3.4	36.1	46.9	13.6	4.8	-----	------	-----	------	2.1	6,978	12,560	1,990	123	----
Same (composite of samples 22388 to 22391, inclusive)	22392	B	1	3.8	36.2	48.1	11.9	4.2	5.2	69.7	1.3	7.7	2.6	7,089	12,760	------	123	----
			2	-----	37.6	50.0	12.4	4.4	5.0	72.5	1.4	4.3	-----	7,372	13,270	------	----	----
			3	-----	42.9	57.1	------	5.0	5.7	82.8	1.6	4.9	-----	8,417	15,150	------	----	----
½ mile southwest of; Pilot Knob mine, Pilot Knob bed (face of main entry).	80008	A	1	2.0	31.8	52.1	14.1	3.1	-----	------	-----	------	1.3	7,017	12,630	2,280	----	79
Same (face of 1 right entry)	80009	A	1	2.0	33.3	53.2	11.5	2.8	-----	------	-----	------	1.1	7,239	13,030	2,300	----	----
Same (face of 1 left entry)	80010	A	1	2.2	33.9	53.9	10.0	2.4	-----	------	-----	------	1.3	7,400	13,320	2,280	----	----
Same (composite of samples 80008 to 80010, inclusive)	80011	A	1	2.4	32.9	52.9	11.8	2.7	5.0	72.1	1.5	6.9	1.2	7,206	12,970	------	----	----
			2	-----	33.7	54.3	12.0	2.8	4.8	73.8	1.5	5.1	-----	7,383	13,290	------	----	----
			3	-----	38.3	61.7	------	3.2	5.5	83.9	1.7	5.7	-----	8,394	15,110	------	----	----
Ravenscroft, ⅜ mile northeast of; Ravenscroft mine, Bon Air (?) bed (face of cross entry, Will Marr entry, 1,500 feet northeast of mine mouth).	22393	B	1	3.4	39.6	46.7	10.3	4.1	-----	------	-----	------	1.8	7,222	13,000	2,050	123	----
Same (face of room, Kelley entry, 2,000 feet north of mine mouth)	22394	B	1	2.8	40.5	46.5	10.2	3.3	-----	------	-----	------	1.3	7,311	13,160	2,190	123	----
Same (face of Campbell entry, 2,700 feet east of mine mouth)	22395	B	1	2.8	39.6	46.4	11.2	5.1	-----	------	-----	------	1.3	7,206	12,970	2,090	123	----
Same (room in new west workings, 1,700 feet west of mine mouth)	22396	B	1	3.4	38.8	47.7	10.1	3.8	-----	------	-----	------	1.8	7,228	13,010	2,210	123	----
Same (composite of samples 22393 to 22396, inclusive)	22397	B	1	3.0	39.7	46.9	10.4	4.1	5.3	71.0	1.4	7.8	1.6	7,250	13,050	------	123	----
			2	-----	40.9	48.4	10.7	4.3	5.1	73.2	1.5	5.2	-----	7,478	13,460	------	----	----
			3	-----	45.8	54.2	------	4.8	5.7	82.0	1.6	5.9	-----	8,378	15,080	------	----	---

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DESCRIPTION OF SAMPLES

The brief descriptions that follow have been compiled from notes made by the persons who took the samples. They give an idea of the methods used in mining and preparing the coals, and supplement the information presented in Table 2.

ANDERSON COUNTY

COAL CREEK. CROSS MOUNTAIN NO. 1 MINE

Analyses 32671 to 32674 (p. 13). Bituminous coal from Cross Mountain No. 1 mine, a drift mine, 5 miles southwest of Coal Creek, on the Southern Railway. Coal bed, Coal Creek; thickness, 3 feet 4 inches to 4 feet. Roof, shale; floor, underclay. The roof over the first 3,000 feet of entry is poor, but farther in it is strong. The floor is an underclay which usually is rather hard, but softens and swells when wet or when pillars are being pulled. The bed was measured and sampled at three points by L. C. Glenn of the Tennessee Geological Survey on September 8, 1919.

Sample 32671, representing 3 feet 4 inches of coal, was measured at room 21, 18 left entry, 5,300 feet southwest of opening; sample 32672, representing 3 feet 4 inches of coal, was measured at room 7, 28 right entry, 9,800 feet from opening north-northwest; and sample 32673, representing 4 feet of coal, was measured at room 36, 24 right entry, 9,000 feet northwest of opening. The ultimate analysis of a composite sample, made by combining face samples 32671 to 32673, is given under laboratory No. 32674.

System of mining, room and pillar. FFF black blasting powder was used. Coal is of such character that it can be marketed either as steam or domestic fuel.

DEVONIA. BUFFALO MINE

Analyses 77135 to 77137 (p. 14). Bituminous coal from Buffalo mine, a drift mine, 2,474 feet above sea level, one-fourth mile west of Devonia on the Tennessee Railway, a branch of the Queen & Crescent system. Coal bed, Big Mary; thickness, 5 feet 6¾ inches to 7 feet 2 inches. Lies nearly flat. Roof, clay shale over limestone; floor, hard clay, may soften if kept wet. Cover at points of sampling, 350 to 400 feet. The bed was measured and sampled at two points by L. C. Glenn for the Tennessee Geological Survey, November 17, 1920, as described below.

Sections of coal bed in Buffalo mine

Section	A	B
Laboratory No.	77135	77136
Roof, clay shale over limestone:	Ft. in.	Ft. in.
Coal	3	3
Pyrite*	* 1	
"Slate" band*		* 1
Coal	2 6¼	4 3½
Clay,* "rashy"	* 1	
Clay,* soft		* 1
Coal	1 2	9
Clay shale*	* 3	
Cannel* coal (bony)	* 2	* 3
Clay,* dark		* 3
Coal	1 ½	1 2¼
Floor, hard clay:		
Thickness of bed	5 6¾	7 2
Thickness of sample	4 11¾	6 6

* Not included in sample.

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Section A (sample 77135) was measured at face of main entry, 700 feet west of mine mouth; and section B (sample 77136) was measured at face of 1 left entry, about 700 feet southwest of entrance. The ultimate analysis of a composite sample, made by combining face samples 77135 and 77136, is given under laboratory No. 77137.

System of mining, room and pillar. Coal was shot off the solid with black blasting powder, but some permissible explosive was used. Mine is just being developed. At time of sampling in 1920, the daily output was 150 to 200 tons; all coal was from advance workings and was run of mine. In 1920 the life of the mine was estimated to be 20 years. All coal is sold to the Southern Railway for locomotives.

OLIVER SPRINGS. WINDROCK MINE

Analyses 32688 to 32692 (p. 15). Bituminous coal from Windrock mine, a drift mine at altitude of 2,400 feet, about 5 miles north of Oliver Springs, Roane County, on the Louisville & Nashville Railroad. Coal bed, Dean; Post-Lee formation; thickness, 4 feet 4½ inches to 5 feet ½ inch. Roof, sandy "slate"; floor, soft clay. Cover at points of sampling, 500 to 600 feet. The bed was measured and sampled at four points as described below on August 8, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Windrock mine

Section Laboratory No.	A 32688	B 32689	C 32690	D 32691
Roof, sandy "slate":	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	1 5	3 1	2 10	3 0
Bone	*2½	*1	*½	*1
Coal	2 9	1 4	1 4	1 3
"Rash"		*6	*2	*2
Coal			8	
Floor, soft clay:				
Thickness of bed	4 4½	5 0	5 ½	4 6
Thickness of sample	4 2	4 5	4 10	4 3

* Not included in sample.

Section A (sample 32688) was measured near head of 16 left entry, 10,500 feet north-northeast of opening; section B (sample 32689) was measured near head of 16 right entry, 9,700 feet northeast of opening; section C (sample 32690) was measured at head of 19 right entry, 11,400 feet northeast of opening; and section D (sample 32691) was measured at head of 18 left entry, 11,000 feet north-northeast of opening. The ultimate analysis of a composite sample, made by combining face samples 32688 to 32691, is given under laboratory No. 32692.

System of mining, room and pillar. Coal was shot off the solid. At time of sampling the daily output was 500 tons. Coal is undercut with longwall electric chain machines and breast electric chain machines and is hauled from room necks to tipple by electric motors.

PETROS. FORK MOUNTAIN MINE

Analysis 32701 (p. 15). Bituminous coal from Fork Mountain mine, 3 miles north of Petros on the Tennessee Railroad. Coal bed, Jellico; thickness, 3 feet 1½ inches. Roof, sandy shale, with occasional soft clay; floor, hard clay. Cover at point of sampling, 200 feet. The bed was measured and sampled by L. C. Glenn on August 12, 1919, for the Tennessee Geological Survey as described on the following page.

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Section of coal bed in Fork Mountain mine

Section Laboratory No	A 35701
Roof, sandy shale:	*Ft. in.*
Bony coal	•3
Coal	1 7
Coal, "rashy"	•2½
Coal	1 1
Floor, hard clay:	
Thickness of coal	3 1½
Thickness of sample	2 8

• Not included in sample.

This section was measured at head of main entry, 300 feet west of opening. The daily output was from 25 to 40 tons.

ROSEDALE. DEERMONT MINE

Analyses 79873 to 79876 (p. 15). Bituminous coal from Deermont mine, a drift mine, 1,496 feet above sea level, three-eighths of a mile north of Rosedale on the Tennessee Railroad. Coal bed, State; thickness, 4 feet 1 inch to 4 feet 10 inches. Roof, sandstone; floor, fairly soft shale. Cover at points of sampling, 100 to 200 feet. The bed was measured and sampled at three points by J. J. Forbes on May 13, 1921, as described below.

Sections of coal bed in Deermont Mine

Section Laboratory No	A 79873	B 79874	C 79875
Roof, sandstone:	*Ft. in.*	*Ft. in*	*Ft. in.*
Coal	2½	2	2
Jack rock	½	1	1
Coal	1 7	2 0	1 7
"Rash" and shale	•3	•8	•2
Coal	6		6
Fire clay		•7	
"Rash" and "slate"	•1 0		•6
Coal		9	
Fire clay	•6½		•5
Coal	8½		8½
Floor, fairly soft shale:			
Thickness of bed	4 10	4 3	4 1½
Thickness of sample	3 ½	3 0	3 ½

• Not included in sample.

Section A (sample 79873) was measured at face of 2 left entry; section B (sample 79874) was measured at face of room off 2 right entry; and section C (sample 79875) was measured at face of room 11 off 1 right entry.

The ultimate analysis of a composite sample, made by combining face samples 79873 to 79875, is given under laboratory No. 79876.

System of mining, room and pillar. Coal is shot off the solid with FF black blasting powder in rooms, 40 per cent dynamite for narrow work cutting shots, and FF powder for blasting roof. At the time of sampling the daily output was 50 tons, all from advance workings. All coal is run of mine. In 1921 the life of the mine was estimated to be 25 years. No marine fossils in roof over coal bed.

ROSEDALE. ROSEDALE MINE

Analyses 79865 to 79868 (p. 15). Bituminous coal from Rosedale mine, a drift mine, 1,500 feet above sea level, 1 mile north of Rosedale on the Tennessee Railroad. Coal bed, State; thickness, 4 feet 1¾ inches to 4 feet 4¾ inches; flat. Roof, sand rock; floor, shale, rather soft. Cover at points of sampling, 100 to 200 feet. The bed was measured and sampled at three points by J. J. Forbes on May 13, 1921, as described on the following page.

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Sections of coal bed in Rosedale mine

Section Laboratory No	A 79865		B 79866		C 79867	
Roof, sand rock:	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal		2		2		2¾
Bone		•1¾				•1
Bone and coal				2		
Coal	1	2			2	0
Coal			2	0		
"Rash"		1½				
"Rash" and shale				•6		•7
Coal		6½				
Fire clay				•9		•7
"Rash" and shale		•9				
Coal				8		8
Fire clay		•10				
Coal		8				
Floor, shale, rather soft:						
Thickness of bed	4	4¾	4	3	4	1¾
Thickness of sample	2	8	3	0	2	10¾

• Not included in sample.

Section A (sample 79865) was measured at face of 1 right; section B (sample 79866) was measured at face of 1 left; and section C (sample 79867) was measured at face of 2 left.

The ultimate analysis of a composite sample, made by combining face samples 79865 to 79867, is given under laboratory No. 79868.

System of mining, room and pillar. Coal is shot off the solid with FF black blasting powder and a permissible explosive. At the time of sampling the daily output was 70 tons, all run of mine, from advance workings. Coal is not screened, but is picked in mine. Output in 1920 was 5,000 tons. In 1921 the life of the mine was estimated to be 25 years.

ROSEDALE. NEW RIVER MINE

Analysis 32703 (p. 15). Bituminous coal from New River mine, 1 mile north of Rosedale on the Tennessee Railroad. Coal bed, Jellico; thickness, 4 feet 6 inches. Roof, sandy shale; floor, hard clay. Cover at point of sampling, 400 feet. The bed was measured and sampled on August 11, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Section of coal bed in New River mine

Section Laboratory No	A 32703	
Roof, sandy shale:	*Ft.*	*in.*
Coal	1	4
Coal, "rashy"		•6
Coal		6
"Rash" and bone		•11
Clay		•5
Coal		10
Floor, hard clay:		
Thickness of coal	4	6
Thickness of sample	2	8

•Not included in sample.

This section was measured at head of main entry, 800 feet southeast of opening. At time of sampling the daily output was 50 tons.

ROSEDALE. CHARLEYS BRANCH MINE

Analysis 32700 (p. 15). Bituminous coal from Charleys Branch mine, 2 miles north of Rosedale on the Tennessee Railroad. Coal bed, Jellico; thickness, 5

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feet 1 inch. Roof, sandy shale; floor, hard clay. Cover at point of sampling, 250 to 300 feet. The bed was measured and sampled by L. C. Glenn on August 11, 1919, for the Tennessee Geological Survey, as described below.

Section of coal bed in Charleys Branch mine

Section Laboratory No.	A 32700
Roof, sandy shale:	Ft. in.
Coal	4
Clay	*2
Coal	2 4½
Coal, "rashy"	*4½
Clay, soft	*10
Coal	1 0
Floor, hard clay:	
Thickness of bed	5 1
Thickness of sample	3 8½

* Not included in sample.

This section was measured at head of main entry, 450 feet southeast of opening. At time of sampling the daily output was 30 to 40 tons.

STAINVILLE. MAIN MOUNTAIN MINE

Analysis 32697 (p. 15). Bituminous coal from Main Mountain mine at Stainville on the Tennessee Railroad. Coal bed, Jellico. Roof, sandy shale; floor, hard clay. Cover at point of sampling, 300 feet. The bed was measured and sampled at one point by L. C. Glenn on August 11, 1919, for the Tennessee Geological Survey, but data were lost in a storm. This section was measured at head of main entry, 400 feet east of opening. At time of sampling the daily output was 10 tons.

CAMPBELL COUNTY

CARYVILLE. BEAR WALLOW NO. 2 MINE

Analyses 32660 to 32663 (p. 17). Bituminous coal from Bear Wallow No. 2 mine at Caryville on the Southern Railway. Coal bed, Coal Creek; thickness, 3 feet 6 inches to 3 feet 10 inches. Roof, shale (poor); floor, underclay. Cover at points of sampling, 1,000 to 1,500 feet. The bed was measured and sampled at three points by L. C. Glenn on July 7, 1919, for the Tennessee Geological Survey, as described below.

Sections of coal bed in Bear Wallow No. 2 mine

Section Laboratory No.	A 32660	B 32661	C 32662
Roof, shale (poor):	Ft. in.	Ft. in.	Ft. in.
Coal	1 2	1 4	3 6
Clay, gray	*9	*6	.....
Coal	1 11	2 0	.....
Floor, underclay:			
Thickness of bed	3 10	3 10	3 6
Thickness of sample	3 1	3 4	3 6

* Not included in sample.

Section A (sample 32660) was measured at head of main entry, 3,000 feet northwest of mouth; section B (sample 32661) was measured at head of right entry; and section C (sample 32662) was measured at head of left entry.

The ultimate analysis of a composite sample, made by combining face samples 32660 to 32662, is given under laboratory No. 32663.

At time of sampling the daily output was 125 tons.

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COTULA. COTULA MINE

Analysis 32685 (p. 19). Bituminous coal from Cotula mine at Cotula on the Louisville & Nashville Railroad. Coal bed, Jellico; thickness of bed, coal, and sample, 33 inches. Roof, sandy shale; floor, hard underclay. Cover at point of sampling, 100 feet. The bed was measured and sampled on July 10, 1919, by L. C. Glenn for the Tennessee Geological Survey. At time of sampling the mine was just developing.

ELK VALLEY. SPLINT MINE

Analyses 32641 to 32643 (p. 19). Bituminous coal from Splint mine, 3 miles northwest of Elk Valley on the Southern Railway. Coal bed, Splint; thickness, 2 feet 8½ inches to 2 feet 10 inches. Roof, shale; floor, hard and soft clay. Cover at points of sampling, 200 to 300 feet. The bed was measured and sampled at two points on July 9, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Splint mine

Section Laboratory No.	A 32641	B 32642
	Ft. in.	*Ft. in.*
Roof, shale:		
Coal	1 3	2 10
Coal, "rashy"	½	
Coal	1 5	
Floor, hard and soft clay:		
Thickness of bed	2 8½	2 10
Thickness of sample	2 8½	2 10

Section A (sample 32641) was measured at 1 right off old main, 800 feet west of opening; and section B (sample 32642) was measured on 2 right entry off old main, 1,000 feet from entrance, northwest.

The ultimate analysis of a composite sample, made by combining face samples 32641 and 32642, is given under laboratory No. 32643.

At time of sampling the daily output was 50 to 100 tons.

MORLEY. MEADOW BRANCH MINE

Analyses 32652 to 32655 (p. 23). Bituminous coal from Meadow Branch mine at Morley on the Louisville & Nashville Railroad. Coal bed, Jellico; thickness of bed, coal, and three samples, 30 inches. Roof, shale; floor, soft "rashy" clay. Cover at points of sampling, 250 to 300 feet. The bed was measured and sampled at three points on July 11, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Section A (sample 32652) was measured near head of 4 left entry, 800 feet west of mouth; section B (sample 32653) was measured at head of 3 left entry, 600 feet inside; and section C (sample 32654) was measured at head of 4 left entry, 1,000 feet west of mouth.

The ultimate analysis of a composite sample, made by combining face samples 32652 to 32653, is given under laboratory No. 32655.

At time of sampling the daily output was from 50 to 100 tons.

NEWCOMB. REGINA SLOPE MINE

Analyses 32644 to 32647 (p. 23). Bituminous coal from Regina Slope mine at Newcomb on the Southern Railway. Coal bed, Swamp Angel; thickness of bed, 2 feet 4 inches to 2 feet 6½ inches. Roof, very dark sandy shale; floor, soft underclay. Cover at points of sampling, 50 feet. The bed was measured and sampled at three points on July 9, 1919, by L. C. Glenn, for the Tennessee Geological Survey, as described on the following page.

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Sections of coal bed in Regina Slope mine

Section Laboratory No	A 32644	B 32645	C 32646
Roof, sandy shale:	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	2 4		7
Coal, bright, clean		6½	
Coal "rashy"		5½	• 1½
Coal			1 10
Coal, clean		1 6½	
Floor, soft underclay:			
Thickness of bed	2 4	2 6½	2 6½
Thickness of sample	2 4	2 6½	2 5

• Not included in sample.

Section A (sample 32644) was measured at head of main entry, 1,200 feet west of opening; section B (sample 32645) was measured at head of 2 right entry, 1,700 feet northwest of opening; and section C (sample 32646) was measured at head of 1 right, 1,000 feet northwest of opening.

The ultimate analysis of a composite sample, made by combining face samples 32644 to 32646, is given under laboratory No. 32647.

At time of sampling the daily output was 50 to 100 tons.

PIONEER. PIONEER MINE

Analyses 32664 to 32666 (p. 25). Bituminous coal from Pioneer mine, a new mine at Pioneer on the Southern Railway. Coal bed, Pioneer; thickness, 3 feet 10½ inches to 4 feet 4 inches. Roof, "slate"; floor, fairly hard underclay. Cover at points of sampling, 300 to 400 feet. The bed was measured and sampled at two points on July 6, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Pioneer mine

Section Laboratory No	A 32664	B 32665
Roof, "slate":	*Ft. in.*	*Ft. in.*
Clay, gray	• 5	
Coal	3 0	2 6
Clay, gray	• 8	• 3
Coal	• 3	4
Clay, gray		• 6
Coal		• 3½
Floor, fairly hard underclay:		
Thickness of bed	4 4	3 10½
Thickness of sample	3 0	2 10

• Not included in sample.

Section A (sample 32664) was measured at head of 5 right entry, 500 feet west-northwest of mouth, and section B (sample 32665) was measured at head of main entry, 500 feet west of opening.

The ultimate analysis of a composite sample, made by combining face samples 32664 and 32665, is given under laboratory No. 32666.

PIONEER. PIONEER JELLICO MINE

Analysis 32686 (p. 25). Bituminous coal from Pioneer Jellico mine, 2 miles northwest of Pioneer on the Southern Railway. Coal bed, not determined; thickness, 4 feet 9 inches. Roof, shale, good; floor, soft underclay. Cover at point of sampling, 100 to 200 feet. The bed was measured and sampled by L. C. Glenn on July 5, 1919, for the Tennessee Geological Survey, as described on the following page.

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Section of coal bed in Pioneer Jellico mine

Laboratory No.	32686
	Ft. in.
Roof, shale:	
Coal	1 6
Clay, bony	• 6
Coal	2 9
Floor, soft underclay:	
Thickness of bed	4 9
Thickness of sample	4 3

• Not included in sample.

This section was measured at main heading, 600 feet from mine mouth. At time of sampling the daily output was 50 tons.

RED ASH, KY. INDIAN MOUNTAIN MINE

Analyses 81236 to 81240 (p. 25). Bituminous coal from Indian Mountain mine, a drift mine 1,400 feet above sea level, three-fourths of a mile south of Red Ash, Ky., on the Southern Railway and Louisville & Nashville Railroad. Coal bed, Jellico; irregular dip. Roof, "slate"; floor, soft to rough fire clay. Cover at points of sampling, 100 to 600 feet. The bed was measured and sampled at four points on August 17, 1921, by W. G. Forrester, as described below.

Sections of coal bed in Indian Mountain mine

Section	A		B		C		D	
Laboratory No.	81236		81237		81238		81239	
	Ft.	in.	Ft.	in.	Ft.	in.	Ft.	in.
Roof, "slate":								
Coal	1	2		1		6		1¼
Coal, bony		1						
Sand band				½				
Rock						1⅝		¼
Coal	1	10	1	5		6⅞	1	0
Coal, bony				⅞		1		1¼
Coal			1	9⅝	2	0	1	11¼
Floor, soft to rough fire clay:								
Thickness of bed	3	1	3	5	3	2	3	2
Thickness of sample	3	1	3	5	3	2	3	2

Section A (sample 81236) was measured at face heading, 2,500 feet northwest of entry; section B (sample 81237) was measured at 10 left, 1,000 feet west of pit mouth; section C (sample 81238) was measured at rib of crosscut, 14 left entry, 2,000 feet northwest; and section D (sample 81239) was measured 1,800 feet northwest of pit mouth at face of 13 right entry.

The ultimate analysis of a composite sample, made by combining face samples 81236 to 81239, is given under laboratory No. 81240.

System of mining, room and pillar. Coal is undercut by machine and shot off the solid with black blasting powder. At time of sampling the daily output was 275 tons, 45 per cent from advance workings. Output in 1920 was 43,000 tons. Coal is run over bar screens, and 5 per cent is run of mine. In 1921 the life of the mine was estimated to be 8 years.

WESTBOURNE. WESTBOURNE NO. 2 MINE

Analyses 32648 to 32651 (p. 26). Bituminous coal from Westbourne No. 2 mine, a drift mine at Westbourne on the Louisville & Nashville Railroad. Coal bed, Jellico; thickness, 3 feet 8 inches to 6 feet. Roof, shale; floor, soft underclay. Cover at points of sampling, 200 to 400 feet. The bed was measured and sampled at three points by L. C. Glenn on July 10, 1919, for the Tennessee Geological Survey, as described on the following page.

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Section of coal bed in Westbourne No. 2 mine

Section Laboratory No.	A 32648	B 32649	C 32650
Roof, shale:	*Ft. in.*	*Ft. in.*	*Ft. in.*
Top coal, left up in A and C			
Coal		6	
Clay	•1 3		•2 3
Rash		•1	
Coal	5	3 1	3
Rash	•1		•1
Coal	3 11		3 3
Floor, soft underclay:			
Thickness of bed	5 8	3 8	6 0
Thickness of sample	4 4	3 7	3 6

• Not included in sample.

Section A (sample 32648) was measured at face 2 right butt entry, 700 feet inside; section B (sample 32649) was measured at face 10 right entry off 20 right butt, 800 feet south of opening; and section C (sample 32650) was measured at head of 4 left butt entry, 800 feet inside mine.

The ultimate analysis of a composite sample, made by combining face samples 32648 to 32650, is given under laboratory No. 32651.

System of mining, room and pillar. At time of sampling the daily output of the mine was 150 tons.

WESTBOURNE. WHITE OAK MINE

Analyses 32656 to 32659 (p. 26). Bituminous coal from White Oak mine, one-half mile east of Westbourne on the Louisville & Nashville Railroad. Coal bed, Log Mountain; thickness, 3 feet 9 inches to 4 feet 1½ inches. Roof, shale; floor, soft underclay. Cover at points of sampling, 400 to 600 feet. The bed was measured and sampled at three points, on July 10, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in White Oak mine

Section Laboratory No.	A 32656	B 32657	C 32658
Roof, shale:	*Ft. in.*	*Ft. in.*	*Ft. in.*
Bone and "rash"	•5		
Coal		4 0	3 9
Coal	3 8½		
Floor, soft underclay:			
Thickness of bed	4 1½	4 0	3 9
Thickness of sample	3 8½	4 0	3 9

• Not included in sample.

Section A (sample 32656) was measured on 3 left entry off drainage tunnel, 1,800 feet from mine mouth; section B (sample 32657) was measured at head of 4 left entry, 2,000 feet from mouth; and section C (sample 32658) was measured at head of 3 right entry, 1,800 feet from mouth.

The ultimate analysis of a composite sample, made by combining face samples 32656 to 32658, is given under laboratory No. 32659.

At time of sampling the daily output of the mine was 300 tons.

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CLAIBORNE COUNTY

ANTHRAS. TACHETT MINE

Analyses 32675 to 32678 (p. 26). Bituminous coal from Tachett mine, 1½ miles south of Anthras on the Southern Railway. Coal bed, Jellico; thickness, 3 feet 10 inches to 4 feet 2 inches. Roof, gray sandy shale; floor, soft clay. Cover at points of sampling, 300 to 400 feet. The bed was measured and sampled at three points, on July 12, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sample 32675, representing 3 feet 10 inches of bed, was measured at head of butt entry, 1,000 feet southwest of mouth; sample 32676, representing 3 feet 11 inches of bed, was measured at 7 left room on butt entry, 900 feet inside; and sample 32677, representing 4 feet 2 inches of bed, was measured at 3 right room, butt entry, 800 feet inside.

The ultimate analysis of a composite sample, made by combining face samples 32675 to 32677, is given under laboratory No. 32678.

At time of sampling the daily output of this mine was 100 to 200 tons.

FONDE, KY. CLEAR FORK MINE

Analyses 32679 to 32683 (p. 28). Bituminous coal from Clear Fork mine, near Fonde, Ky., on the Southern Railway. Coal bed, Mingo; thickness, 4 feet 11 inches to 5 feet 3 inches. Roof, shale; floor, hard underclay. Cover at points of sampling, 1,000 to 1,500 feet. The bed was measured and sampled at four points on July 11, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Clear Fork mine

Section Laboratory No.	A 32679	B 32680	C 32681	D 32682
Roof, shale:	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal	2 2	2 1	2 2	2 3
Clay	• 1	• 1	• 1	
Clay, hard				• 1½
Coal	2 9	2 9	3 0	2 9
Floor, hard underclay:				
Thickness of bed	5 0	4 11	5 3	5 1½
Thickness of sample	4 11	4 10	5 2	5 0

• Not included in sample.

Section A (sample 32679) was measured on 3 left entry off 2 face, 11,000 feet inside; section B (sample 32680) was measured at 1 room, 2 right entry, off 2 face entry, 12,000 feet inside; section C (sample 32681) was measured at 4 right aircourse off 2 face entry, 12,000 feet southeast of entrance; and section D (sample 32682) was measured at head of 2 face heading, 10,500 feet southeast of entrance.

The ultimate analysis of a composite sample, made by combining face samples 32679 to 32682, is given under laboratory No. 32683.

At time of sampling the daily output was 12,000 tons.

FORK RIDGE. MINGO NO. 3 MINE

Analyses 33457 to 33459 (p. 28). Bituminous coal from Mingo No. 3 mine, at Fork Ridge on the Southern Railway. Coal bed, Mingo; thickness, 4 feet 7 inches to 4 feet 10 inches. Roof, shale; floor, soft clay. Cover at points of sampling, 400 to 600 feet. The bed was measured and sampled at two points on September 1, 1919, by L. C. Glenn, for the Tennessee Geological Survey, as described on the following page.

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Sections of coal bed in Mingo No. 3 mine

Section	A	B
Laboratory No.	33457	33458
Roof, shale:	Ft. in.	Ft. in.
Coal	*3	8
Clay	*1 3	
Clay and bone		*1 2
Coal	3 1	2 0
Coal, "rashy"		1
Coal		11
Floor, soft clay:		
Thickness of bed	4 7	4 10
Thickness of sample	3 1	3 8

*Not included in sample.

Section A (sample 33457) was measured near head 4 left entry; and section B (sample 33458) was measured near head of 2 right entry.

The ultimate analysis of a composite sample, made by combining face samples 33457 and 33458, is given under laboratory No. 33459.

At the time of sampling the daily output was 250 tons.

FORK RIDGE. MINGO NO. 4 MINE

Analysis 33460 (p. 28). Bituminous coal from Mingo No. 4 mine, at Fork Ridge on the Southern Railway. Coal bed, Poplar Lick; thickness, 3 feet 4 inches. Roof, shale; floor, soft clay. Cover at point of sampling, 200 to 250 feet. The bed was measured and sampled on September 1, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Mingo No. 4 mine

Section	A
Laboratory No.	33460
Roof, shale:	Ft. in.
Coal	1 0
Clay, with "rash" and thin coal streaks	*9
Coal	1 7
Floor, soft clay:	
Thickness of bed	3 4
Thickness of sample	2 7

*Not included in sample.

This section was measured on main entry, 600 feet inside.

At time of sampling the daily output was 25 to 30 tons.

FORK RIDGE. NICHOLSON NO. 2 MINE

Analyses 33461 to 33464 (p. 28). Bituminous coal from Nicholson No. 2 mine at Fork Ridge on the Southern Railway. Coal bed, Jack Rock or Mingo; thickness, 4 feet 6½ inches to 5 feet 11 inches. Roof, "rashy" shale or "slate;" floor, hard clay. Cover at points of sampling, 600 to 800 feet. The bed was measured and sampled at three points, on September 1, 1919, by L. C. Glenn, for the Tennessee Geological Survey, as described on the following page.

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Sections of coal bed in Nicholson No. 2 mine

Section Laboratory No.	A 33461	B 33462	C 33463
Roof, "rashy" shale or "slate":	Ft. in.	Ft. in.	Ft. in.
Coal	9	• 3	• 3
Shale	• ½		
Clay, "rashy"		• 10	• 8
Coal	1 7	1 1	1 1
"Jack rock"	• 3		
"Sulphur"		• ½	• 1
Clay	• 10		
Coal		1 5½	1 6
Coal	1 1		
"Jack rock," bony		• 3	
Bone			• 5
"Rash"		• 4	
Clay, gray			• 6
Clay		• 7	
Coal			1 1
Coal		1 1	
Floor, hard clay:			
Thickness of bed	4 6½	5 11	5 7
Thickness of sample	3 5	3 7½	3 8

• Not included in sample.

Section A (sample 33461) was measured at head of 8 right entry, 2,600 feet inside; section B (sample 33462) was measured at head of 7 right entry, 2,600 feet inside; and section C (sample 33463) was measured at head of 7 left entry, 2,500 feet from mouth.

The ultimate analysis of a composite sample, made by combining face samples 33461 to 33463, is given under laboratory No. 33464.

At time of sampling the daily output was 300 tons.

PRUDEN. VALLEY CREEK MINE

Analyses 79860 to 79864 (p. 30). Bituminous coal from Valley Creek mine, a drift mine, 1,700 feet above sea level, 2 miles southwest of Pruden on the Southern Railway. Coal bed, Mingo; dip, flat (wavy floor); thickness, 4 feet 6½ inches to 5 feet 6¼ inches. Roof, "draw slate"; floor, soft fire clay. Cover at points of sampling, 125 to 500 feet. The bed was measured and sampled at four points by J. J. Forbes on May 10, 1921, as described below.

Sections of coal bed in Valley Creek mine

Section Laboratory No.	A 79860	B 79861	C 79862	D 79863
Roof, "draw slate":	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Slate	• 1½	• 1 8	• 6	• 2 0
Coal	2 1			
Coal		1 1	2 8	2 1
Fire clay	• 4		• 2½	• 3
Dirt		¼		
Coal	8	3½	9	7
Fire clay	• 8			
Dirt (mother coal)		¼		
Fire clay and "rash"			• 5	• 6
"Rash" and fire clay	• 8			
Coal		3		
Fire clay		• 5½		
Coal		8½		
Fire clay and "rash"		• 10		
Coal		2		
Floor, soft fire clay:				
Thickness of bed	4 6½	5 6¼	4 6½	5 5
Thickness of sample	2 9	2 6½	3 5	2 8

• Not included in sample.

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Section A (sample 79860) was measured at face of 6 aircourse; section B (sample 79861) was measured at face of 1 main entry; section C (sample 79862) was measured at face of 3 right entry; and section D (sample 79863) was measured at face of 9 right entry.

The ultimate analysis of a composite sample, made by combining face samples 79860 to 79863, is given under laboratory No. 79864.

System of mining, room and pillar. Coal is undercut with machines; FF black blasting powder is used. All coal is run of mine, 90 per cent from advance workings. Output in 1920 was 30,000 tons. At time of sampling the daily output was 400 tons. In 1921 the life of mine was estimated to be 40 years.

ROGERTON. ROGERTON MINE

Analysis 32684 (p. 31). Bituminous coal from Rogerton mine at Rogerton on the Southern Railway. Coal bed, Jellico; thickness of bed, coal, and samples, 30 inches. Roof, black tough shale; floor, soft clay. Cover at point of sampling, 300 to 400 feet. The bed was sampled by L. C. Glenn on July 12, 1919, for the Tennessee Geological Survey.

This section was measured at head of main entry, 3,000 feet west of mouth.

At the time of sampling the daily output was 50 to 100 tons.

CUMBERLAND COUNTY

CRAB ORCHARD. HALEY MOUNTAIN NO. 1 MINE

Analyses 33471 to 33473 (p. 31). Bituminous coal from Haley Mountain No. 1 mine, 1½ miles east of Crab Orchard on the Tennessee Central Railroad. Coal bed, Sewanee; thickness, 6 to 7 feet. Roof, shale; floor, conglomerate or "slate." Cover at points of sampling, 500 to 600 feet. The bed was measured and sampled at two points on August 29, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sample 33471, representing 7 feet of bed, was measured near head of 1 right entry, 1,300 feet southwest of opening, and sample 33472, representing 6 feet of bed, was measured 1,300 feet east of opening.

The ultimate analysis of a composite sample, made by combining face samples 33471 and 33472, is given under laboratory No. 33473.

At time of sampling the daily output was 35 tons.

OZONE. FOX DEN MINE

Analysis 33474 (p. 31). Bituminous coal from Fox Den mine, 2 miles north of Ozone on the Tennessee Central Railroad. Coal bed, Sewanee; thickness of bed, coal, and sample, 8 feet. Roof and floor, slate. Cover at point of sampling, 300 feet, more or less. The bed was measured and sampled on August 28, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured 600 feet from mine mouth on 1 right, at split.

At time of sampling the daily output was 50 to 150 tons.

OZONE. NELSON MINE

Analysis 33475 (p. 31). Bituminous coal from Nelson mine, 2 miles north of Ozone on the Tennessee Central Railroad. Coal bed, Nelson; thickness of bed, coal, and sample, 2 feet 5 inches. Roof, "draw slate"; floor, hard, gray shale. Cover at point of sampling, 200 feet. This section was measured and sampled on August 29, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured 300 feet west of mouth.

At time of sampling the daily output was up to 50 tons.

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PEAVINE. PEAVINE MINE

Analyses 80012 to 80014 (p. 31). Bituminous coal from Peavine mine, a prospect drift, 1,800 feet above sea level, 2 miles east of Peavine; no railroad connections. Coal bed, Sewanee; dip, 1 per cent southwest; thickness of bed, 16 feet 3 inches. Roof, sandy shale; floor, 6 inches of coal. Cover at points of sampling, 10 to 25 feet. This bed was measured and sampled on May 20, 1921, by J. J. Forbes, as described below.

Section of coal bed in Peavine mine

Section Laboratory No.	A 80012	B 80013
Roof, sandy shale:	*Ft. in.*	*Ft. in.*
Coal, immediate roof	2 0	
Coal		10 3
Coal	[a]8 3	
Coal		[b]6 0
Coal	[b]6 0	
Floor, 6 inches of coal:		
Thickness of bed	16 3	16 3
Thickness of sample	8 3	10 3

[a] Section of bed sampled 8¼ feet—some small "sulphur" balls and "sulphur" bands in bed.
[b] Unable to get full section of bed.

Section A (sample 80012) was measured 20 feet from portal, prospect opening; and section B (sample 80013) was measured 35 feet from portal in crosscut between two prospect entries.

The ultimate analysis of a composite sample, made by combining face samples 80012 and 80013, is given under laboratory No. 80014.

FENTRESS COUNTY

WILDER. BIG LAUREL MINE NO. 2

Analysis 33476 (p. 32). Bituminous coal from Big Laurel No. 2 mine, 2 miles east of Wilder on the Tennessee Central Railroad. Coal bed, Wilder; thickness of bed, coal, and sample, 3 feet 5 inches. Roof, sandy shale; floor, hard clay. Cover at point of sampling, 150 feet. The bed was measured and sampled on September 3, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured at head of 1 right entry, 600 feet southeast of opening.

At time of sampling the daily output was 100 tons.

WILDER. WILDER NO. 3 MINE

Analyses 33449 to 33453 (p. 32). Bituminous coal from Wilder No. 3 mine, a drift mine, 1,630 feet above sea level, 1½ miles northeast of Wilder on the Tennessee Central Railroad. Coal bed, Bon Air No. 2; thickness, 3 feet 8 inches to 4 feet 11 inches. Roof, shale; floor, hard clay. Cover at points of sampling, 200 feet. The bed was measured and sampled at four points on September 2, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described on the following page.

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Sections of coal bed in Wilder No. 3 mine

Section	A	B	C	D
Laboratory No.	33449	33450	33451	33452
Roof, shale:	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	4 10	3 8	1 1	11
"Rash"	•1			
Bone and shale			•1½	
Bone				•½
Coal			3 8	3 2
Floor, hard clay:				
Thickness of bed	4 11	3 8	4 9½	4 1½
Thickness of sample	4 10	3 8	4 9	4 1

• Not included in sample.

The ultimate analysis of a composite sample, made by combining face samples 33449 to 33452, is given under laboratory No. 33453.

At the time of sampling the daily output was 500 to 800 tons.

ZENITH. WHITE OAK MINE

Analyses 32798 to 32801 (p. 32). Bituminous coal from White Oak mine at Zenith on the Oneida & Western Railroad. Coal bed, White Oak; thickness, 2 feet 11½ inches to 3 feet 4 inches. Roof, sandy shale; floor, "rashy" clay. Cover at points of sampling, 400 to 500 feet. The bed was measured and sampled at three points on September 23, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in White Oak mine

Section	A	B	C
Laboratory No.	32798	32799	32800
Roof, sandy shale:	Ft. in.	Ft. in.	Ft. in.
Coal	2 10	3 3	3 4
Bone	•½		
Coal	1		
Floor, "rashy" clay:			
Thickness of bed	2 11½	3 3	3 4
Thickness of sample	2 11	3 3	3 4

• Not included in sample.

Section A (sample 32798) was measured at head of short dog off straight right entry; section B (sample 32799) was measured near head of room, main straight left entry; and section C (sample 32800) was measured at head of 2 left entry off main straight left entry.

The ultimate analysis of a composite sample, made by combining face samples 32798 to 32800, is given under laboratory No. 32801.

At time of sampling the daily output of the mine was 125 tons.

GRUNDY COUNTY

COALMONT. DIXIE NO. 4 MINE

Analysis 32584 (p. 33). Bituminous coal from Dixie No. 4 mine, 1½ miles west of Coalmont, on the Nashville, Chattanooga & St. Louis Railway. Coal bed, Sewanee; thickness of bed, coal, and sample, 2 feet 10¾ inches. Roof, shale; floor, soft shale. Cover at point of sampling, about 40 feet. The bed was measured and sampled on July 26, 1919, by Wilbur A. Nelson, for the Tennessee Geological Survey.

This section was measured at 3 right room off main entry in No. 4 mine.

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FREMONT. TRACY CITY NO. 3 MINE

Analysis 32582 (p. 33). Bituminous coal from Tracy City No. 3 mine, at Fremont, on the Nashville, Chattanooga & St. Louis Railway. Coal bed, Sewanee; thickness of bed, coal, and sample, 3 feet 5 inches. Roof and floor, shale. Cover at point of sampling, about 40 feet. The bed was measured and sampled at one point by W. A. Nelson for the Tennessee Geological Survey on July 26, 1919.

This section was measured at face of 2 room, on 1 left entry off 2 left entry.

FREMONT. TRACY CITY NO. 4 MINE

Analysis 32583 (p. 33). Bituminous coal from Tracy City No. 4 mine, 1½ miles west of Coalmont, on the Nashville, Chattanooga & St. Louis Railway. Coal bed, Sewanee; thickness, 3 feet 9 inches. Roof and floor, shale. Cover at point of sampling, about 30 feet. The bed was measured and sampled on July 26, 1919, by W. A. Nelson for the Tennessee Geological Survey, as described below.

Section of coal bed in Tracy City No. 4 mine

Section	A	
Laboratory No.	32583	
	Ft.	*in.*
Roof, shale:		
"Rash"		*7
Coal, soft	2	0
Coal, harder	1	2
Floor, shale:		
Thickness of bed	3	9
Thickness of sample	3	2

* Not included in sample.

This section was measured at 7 room on 2 left entry.

PALMER. TENNESSEE CONSOLIDATED NO. 8 MINE

Analysis 32586 (p. 33). Bituminous coal from Tennessee Consolidated No. 8 mine, 1 mile south of Palmer, on the Nashville, Chattanooga & St. Louis Railway. Coal bed, Sewanee; thickness of bed, coal, and sample, 3 feet 9 inches. Roof, sandstone; floor, shale. Cover at point of sampling, over 100 feet. The bed was measured and sampled by W. A. Nelson for the Tennessee Geological Survey on July 25, 1919.

The bed was sampled at heading, main entry, 960 feet from the mine mouth.

PALMER. TENNESSEE CONSOLIDATED NO. 16 MINE

Analysis 32587 (p. 33). Bituminous coal from Tennessee Consolidated No. 16 mine, 1 mile south of Palmer, on the Nashville, Chattanooga & St. Louis Railway. Coal bed, Sewanee; thickness of bed, coal, and sample, 4 feet 3 inches. Roof, sandstone; floor, shale. Cover at point of sampling, over 100 feet. The bed was measured and sampled by W. A. Nelson for the Tennessee Geological Survey on July 25, 1919.

This section was measured in main entry, 340 feet beyond 1 cross entry.

PALMER. PALMER MINE

Analyses 80064 to 80070 (p. 33). Bituminous coal from Palmer mine, a drift mine 1,830 feet above sea level, 1 mile north of Palmer, on the Nashville, Chattanooga & St. Louis Railway. Coal bed, Sewanee; thickness, 1 foot 10¼ inches to 3 feet 10¾ inches; dip, about 1° southwest. Roof, sandstone; floor, hard fire clay. Cover at points of sampling, 300 feet. The bed was measured and sampled at six points on May 26, 1921, by J. J. Forbes, as described on the following page.

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Sections of coal bed in Palmer mine

Section	A	B	C	D	E	F
Laboratory No.	80064	80065	80066	80067	80068	80069
Roof, sandstone:	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.	Ft. in.
Coal	3	2½	3 0	2½	2½	2½
"Mother coal"	½	½		1	½	½
Coal	7	6		3 6	7	7
"Mother coal"	¾	1			¾	¾
Coal	3	2 4			3 0	3 0
"Rash"	• 4	• 6				
Floor, hard fire clay:						
Thickness of bed	1 6¼	3 8	3 0	3 9½	3 10¾	3 10¾
Thickness of sample	1 2¼	3 2	3 0	3 9½	3 10¾	3 10¾

• Not included in sample.

Section A (sample 80064) was measured at face of 9 entry (South Spruce opening); section B (sample 80065) was measured at face of E entry (South Spruce opening); section C (sample 80066) was measured at face of 4 main entry; section D (sample 80067) was measured at face of 2 left of 1 opening (Mill Creek); section E (sample 80068) was measured at face of 1 left off 16 entry (North Spruce mine); and section F (sample 80069) was measured at face of 22 entry.

The ultimate analysis of a composite sample, made by combining face samples 80064 to 80069, is given under laboratory No. 80070.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder. Coal is picked in mine and on car, and 5 per cent of coal is screened for commercial use. At the time of sampling the daily output was 1,250 tons, all from advance workings; 97 per cent is run of mine. In 1921 the life of the mine was estimated to be 73 years.

MORGAN COUNTY

CATOOSA. RED EYE MINE

Analysis 32758 (p. 37). Bituminous coal from Red Eye mine, at Catoosa, on the Morgan & Fentress Railroad. Coal bed, Catoosa. Roof, dark sandy shale; floor, soft clay. Cover at point of sampling, 250 feet. The bed was measured and sampled on August 14, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Section of coal bed in Red Eye mine

Laboratory No.	32758
Roof, dark sandy shale:	Ft. in.
Coal	4½
"Rash"	• 2½
Coal	2 6
Floor, soft clay:	
Thickness of bed	3 1
Thickness of sample	2 10½

• Not included in sample.

This section was measured at head of 7 right entry, 900 feet south-southwest of opening.

At time of sampling the daily output was 25 to 50 tons.

CATOOSA. PANTHER NO. 2 MINE

Analyses 32746 to 32748 (p. 37). Bituminous coal from Panther No. 2 mine, 1,000 feet west of Catoosa on Morgan & Fentress Railroad. Coal bed, Catoosa;

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thickness, 2 feet 11 inches to 3 feet 5 inches. Roof, dark sandy shale; floor, soft clay. Cover at points of sampling, 300 feet. The bed was measured and sampled at two points on August 14, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Panther No. 2 mine

Section Laboratory No.	A 32746		B 32747	
	Ft.	*in.*	*Ft.*	*in.*
Roof, dark sandy shale:				
Coal		10	2	11
"Slate," in lenses		[a] 1		
Coal	2	6		
Floor, soft clay:				
Thickness of bed	3	5	2	11
Thickness of sample	3	4	2	11

[a] Not included in sample.

Section A (sample 32746) was measured at head of cross entry from 5 right entry, 1,200 feet south of opening; section B (sample 32747) was measured at head of 5 right entry, 1,200 feet south-southeast of opening.

The ultimate analysis of a composite sample, made by combining face samples 32746 and 32747, is given under laboratory No. 32748.

At time of sampling the daily output was 150 tons.

CATOOSA. COW FORD NO. 4 MINE

Analysis 32756 (p. 37). Bituminous coal from Cow Ford No. 4 mine, 1 mile east of Catoosa, on the Morgan & Fentress Railroad. Coal bed, Catoosa; thickness of coal and bed, 34 inches. Roof, dark shale; floor, hard clay. Cover at point of sampling, 250 feet. The bed was measured and sampled on August 17, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured at head of main right entry, 1,500 feet south of entrance.

CATOOSA. COW FORD NO. 5 MINE

Analysis 32757 (p. 37). Bituminous coal from Cow Ford No. 5 mine, 1 mile east of Catoosa on the Morgan & Fentress Railroad. Coal bed, Catoosa; thickness of bed and of coal sampled, 29 inches. Roof, dark shale; floor, hard clay. Cover at point of sampling, 50 feet. The bed was measured and sampled on August 17, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured at head of main entry, 80 feet southwest of opening.

NEMO. TAYLOR MINE

Analyses 32759 and 32760 (p. 39). Bituminous coal from Taylor mine, one-half mile northwest of Nemo on the Southern Railway. Upper bed: Roof, dark shale; floor, soft clay. Lower bed: Roof, sandstone; floor, sandstone. Cover at points of sampling, 150 to 200 feet. The bed was measured and sampled at two points on August 14, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described on the following page.

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Sections of coal bed in Taylor mine

Section	A	B
Laboratory No.	32759	32760
Roof, dark shale:		
Coal	Ft. 2 in. 1	Ft. 2 in. 2
Clay, hard		* 1 10
Coal		6
Floor, soft clay:		
Thickness of bed	2 1	4 6
Thickness of sample	2 1	2 8

* Not included in sample.

Section A (sample 32759) was measured at head of main entry, 300 feet east of opening; and section B (sample 32760) was measured at head of east entry, 200 feet south of opening.

At time of sampling the daily output was 50 tons or less from the upper bed and 25 tons or less from the lower bed which was only worked in winter.

OAKDALE. BAHAHATCHIE MINE

Analysis 32755 (p. 39). Bituminous coal from Bahahatchie mine, one-half mile south of Oakdale on the Southern Railway. Coal bed, not known; thickness of bed, coal, and sample, 22 inches. Roof, sandy shale; floor, hard clay. Cover at point of sampling, 400 feet. This section was measured and sampled on August 18, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured at head of 1 entry, 600 feet east of opening.

In 1919 the daily output of the mine was from 25 to 50 tons.

OLIVER SPRINGS. NEW EAGLE NO. 1 MINE

Analysis 32699 (p. 39). Bituminous coal from New Eagle No. 1 mine, 2 miles northwest of Oliver Springs on the Southern Railway. Coal bed, Poplar Creek; thickness of bed and of coal sampled, 30 inches. Roof, shale, poor; floor, hard clay. Cover at point of sampling, approximately 200 feet. The bed was measured and sampled on August 17, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured at head of main opening, 250 feet north of mouth.

At time of sampling the daily output was 25 to 50 tons.

OLIVER SPRINGS. UNION MINE

Analysis 32702 (p. 39). Bituminous coal from Union mine, 2 miles northwest of Oliver Springs on the Southern Railway. Coal bed, Poplar Creek. Roof, shale; floor, hard clay. Cover at point of sampling, 200 feet. The bed was measured and sampled on August 7, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Section of coal bed in Union mine

Laboratory No.	32702
Roof, shale:	
Coal, "rashy"	Ft. in. * 4½
Coal	2 5
Clay, "rashy"	* 1
Coal	4
Floor, hard clay:	
Thickness of bed	3 2½
Thickness of sample	2 9

* Not included in sample.

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This section was measured at head of short dog from main entry, 800 feet west of opening.

PETROS. BIG BRUSHY NO. 1 MINE

Analyses 82638 to 82642 (p. 40). Bituminous coal from Big Brushy No. 1 mine, a drift mine 1,525 feet above sea level, one-fourth mile southeast of Petros on the Harriman & Northeastern Railroad (Southern system). Coal bed, Brushy Mountain or No. 5; thickness, 2 feet 8¾ inches to 3 feet 3½ inches; dip, 1°; strike, northwest and southeast. Roof, good slate; floor, hard, smooth and rough sandstone and sandy shale. Cover at points of sampling, 200 to 800 feet. The bed was measured and sampled at four points on October 31, 1921, by W. A. Forrester, as described below.

Sections of coal bed in Big Brushy mine

Section Laboratory No.	A 82638	B 82639	C 82640	D 82641
Roof, good slate:	*Ft. in.*	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, lustrous	7¼	11¾	5	
Coal				7
Shale, black flaky	* 4½			
Coal, soft shaly		¼		1
Shale, soft flaky			* 1½	
Coal	1			2¼
Coal, soft massive		1 ½		
Shaly coal	* 3		1	
"Rash," soft flaky		½		
Coal			3	
Shale, flaky				½
Coal, soft massive	6½			
Coal		10		5
"Rash"	1		½	
Coal			3¾	
"Mother coal"				1
Coal, lustrous	9½			
"Sulphur" band			* ¼	
Coal			2½	1¾
Shale, flaky				½
Shale, soft			1¼	
Coal			1 7½	1 8½
Floor, sandstone and sandy shale:				
Thickness of bed	2 8¾	2 11	3 2¼	3 3½
Thickness of sample	2 1¼	2 11	3 ½	3 3½

* Not included in sample.

Section A (sample 82638) was measured at 5 right off 1 main, 1,000 feet south 50° east of entry stump; section B (sample 82639) was measured at 2 main, 3,000 feet south 15° east; section C (sample 82640) was measured at 4 right off 2 main, 3,000 feet south 15° west; and section D (sample 82641) was measured at 2 main, 1,800 feet south.

The ultimate analysis of a composite sample, made by combining face samples 82638 to 82641, is given under laboratory No. 82642.

System of mining, room and pillar. Coal is undercut by pick; FF black blasting powder is used. At time of sampling the daily output was 150 tons. All coal shipped as run of mine. Output in 1920 was 18,865 tons. Mining is on the retreat, and only entry stumps on the main haulageways remain to be robbed. At time of sampling the life of mine was estimated to be four years.

PETROS. BIG BRUSHY NO. 2 MINE

Analyses 32693 to 32696 (p. 40). Bituminous coal from Big Brushy No. 2 mine at Petros on the Harriman & Northeastern Railroad (Southern system). Coal bed, Jellico; thickness, 2 feet 2 inches to 2 feet 8½ inches. Roof, dark shale; floor, hard clay. Cover at points of sampling, 1,000 to 1,500 feet. The bed was measured and sampled at three points on August 12, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described on the following page.

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Sections of coal bed in Big Brushy No. 2 mine

Section	A	B	C
Laboratory No.	32693	32694	32695
Roof, dark shale:	Ft. in.	Ft. in.	Ft. in.
Coal	7	7½	6
"Rash"	• 1		• ½
"Rash," knife edge			
Coal	6	5½	5
"Rash"	• ½		
Clay, "rashy"		• 1	• ½
Coal	9	1 4½	1 2
"Rash," knife edge			
Coal	9		
Floor, hard clay:			
Thickness of bed	2 8½	2 6½	2 2
Thickness of sample	2 7	2 5½	2 1

• Not included in sample.

Section A (sample 32693) was measured at main heading, 3,200 feet east of opening; section B (sample 32694) was measured at rib on 1 main at 14 left, 2,600 feet east of opening; and section C (sample 32695) was measured at head of 14 left entry, 3,000 feet east of opening.

The ultimate analysis of a composite sample, made by combining face samples 32693 to 32695, is given under laboratory No. 32696.

At time of sampling the daily output was 150 to 200 tons.

OVERTON COUNTY

DAVIDSON. GOOCH MINE

Analyses 33445 to 33448 (p. 41). Bituminous coal from Gooch mine at Davidson on the Tennessee Central Railroad. Coal bed, Wilder; thickness, 3 feet 2 inches to 3 feet 9 inches. Roof, sandy, tough slate to normal slate; floor, hard clay. Cover at points of sampling, 150 to 200 feet. The bed was measured and sampled at three points on September 3, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sample 33445, representing 3 feet 9 inches of bed, was measured at head of 2 right entry, 675 feet inside, west of mouth; sample 33446, representing 3 feet 2 inches of bed, was measured at main head, 560 feet southwest of mouth; and sample 33447, representing 3 feet 7 inches, was measured at head of 1 left, 600 feet from opening.

The ultimate analysis of a composite sample, made by combining face samples 33445 to 33447, is given under laboratory No. 33448.

At time of sampling the daily output was 150 tons.

DAVIDSON. BUCKEYE MINE

Analyses 33441 to 33444 (p. 41). Bituminous coal from Buckeye mine, one-half mile west of Davidson on the Tennessee Central Railroad. Coal bed, Wilder; thickness, 4 feet 8 inches to 4 feet 10 inches. Roof, slate; floor, hard clay. Cover at points of sampling, 150 to 200 feet. The bed was measured and sampled at three points on September 3, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sample 33441, representing 4 feet 10 inches of bed, was measured at head of 1 left entry, 250 feet southwest of opening; sample 33442, representing 4 feet 9½ inches of bed, was measured at head of main entry, 250 feet northwest of mouth; and sample 33443, representing 4 feet 8 inches of bed, was measured near head of 1 right entry, 300 feet northwest of mouth.

The ultimate analysis of a composite sample, made by combining face samples 33441 to 33443, is given under laboratory No. 33444.

At time of sampling the daily output was 150 tons.

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DAVIDSON. TUNNEL MINE

Analyses 33437 to 33440 (p. 41). Bituminous coal from Tunnel mine, one-half mile northwest of Davidson on the Tennessee Central Railroad. Coal bed, Wilder; thickness, 4 feet 6 inches to 5 feet 5 inches. Roof, sandy to normal "slate"; floor, hard clay. Cover at points of sampling, 150 to 200 feet. The bed was measured and sampled at three points on September 4, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Tunnel mine

Section	A		B		C	
Laboratory No.	33437		33438		33439	
Roof, sandy to normal "slate":	*Ft.*	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Coal	4	4	5	5	4	11
"Rash"		•2				
Floor, hard clay:						
Thickness of bed	4	6	5	5	4	11
Thickness of sample	4	4	5	5	4	11

• Not included in sample.

Section A (sample 33437) was measured at room 40 off 4 left entry; section B (sample 33438) was measured at head of 6 left, 1,750 feet inside; and section C (sample 33439) was measured at head of main entry, 1,800 feet northwest of mouth.

The ultimate analysis of a composite sample, made by combining face samples 33437 to 33439, is given under laboratory No. 33440.

At time of sampling the daily output was 200 tons.

DAVIDSON. BRIER HILL NO. 1 MINE

Analyses 33468 to 33470 (p. 41). Bituminous coal from Brier Hill mine, 1½ miles southwest of Davidson on the Tennessee Central Railroad. Coal bed, Wilder; thickness, 4 feet 2½ inches to 4 feet 10½ inches. Roof, "slate"; floor, shale and sandy shale. Cover at points of sampling, 175 to 200 feet. The bed was measured and sampled at two points on August 30, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sections of coal bed in Brier Hill No. 1 mine

Section	A		B	
Laboratory No.	33468		33469	
Roof, "slate":	*Ft.*	*in.*	*Ft.*	*in.*
Coal	4	0	4	10
"Rash"		•½		•½
Coal		•2		
Floor, shale and sandy shale:				
Thickness of bed	4	2½	4	10½
Thickness of sample	4	0	4	10

• Not included in sample.

Section A (sample 33468) was measured at head of aircourse on main entry, 1,300 feet southwest of opening; and section B (sample 33469) was measured on 5 right off 1 left entry, 1,000 feet northwest of mouth.

The ultimate analysis of a composite sample, made by combining face samples 33468 and 33469, is given under laboratory No. 33470.

At time of sampling the daily output was 1,200 tons.

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DAVIDSON. BRIER HILL NO. 2 MINE

Analyses 33465 to 33467 (p. 42). Bituminous coal from Brier Hill mine, 1½ miles southwest of Davidson on the Tenneessee Central Railroad. Coal bed, Wilder; thickness, 3 feet 10 inches to 4 feet 4 inches. Roof, sandstone and shale; floor, sandstone and very sandy shale. Cover at points of sampling, 150 to 200 feet. The bed was measured and sampled at two points on August 30, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sample 33465, representing 3 feet 10 inches of bed, was measured at head of 4 east entry off 1 south off 1 east, 1,000 feet southeast of opening; and sample 33466, representing 4 feet 4 inches of bed, was measured at head of 6 east entry off main, 1,100 feet southeast of opening.

The ultimate analysis of a composite sample, made by combining face samples 33465 and 33466, is given under laboratory No. 33467.

At time of sampling the output was 1,200 tons.

MONTEREY. BILLS BRANCH MINE

Analyses 33454 to 33456 (p. 42). Bituminous coal from Bills Branch mine, a drift mine 1,825 feet above sea level, 10 miles northeast of Monterey, Putnam County, on the Tennessee Railroad. Coal bed, Bon Air No. 2; thickness, 3 feet 5½ inches; flat. Roof, sandstone; floor, hard fire clay. Cover at points of sampling, 200 to 300 feet. The bed was measured and sampled at two points on September 2, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sample 33454, representing 3 feet 6 inches of bed, was measured at head of 4 right entry, 800 feet inside; and sample 33455, representing 3 feet 5 inches of bed, was measured at head of main entry, 600 feet west of opening.

The ultimate analysis of a composite sample, made by combining face samples 33454 and 33455, is given under laboratory No. 33456.

At the time of sampling the daily output was 50 to 100 tons.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder. All coal is from advance workings. Shaker screens are used, producing lump, nut, and slack. Coal is picked in mine and on car. Output in 1920 was 22,000 tons. In 1921 the life of the mine was estimated to be 15 years.

Analyses 79884 to 79887 (p. 42). See preceding description of coal bed; thickness, 2 feet 5 inches to 3 feet 2¾ inches. Cover at points of sampling, 125 to 160 feet. The bed was measured and sampled at three points on May 18, 1921, by J. J. Forbes, as described below.

Sections of coal bed in Bills Branch mine

Section	A		B		C
Laboratory No.	79884		79885		79886
	Ft.	*in.*	*Ft.*	*in.*	*Ft.*	*in.*
Roof, sandstone:						
Coal	2	5	2	8	1	
"Sulphur"					• 1¼	
Coal					2	10½
"Rash"					• 2	
Floor, hard fire clay:						
Thickness of bed	2	5	2	8	3	2¾
Thickness of sample	2	5	2	8	2	11½

• Not included in sample.

Section A (sample 79884) was measured at face of 1 main entry; section B (sample 79885) was measured at face of 4 right entry; and section C (sample 79886) was measured at face of 2 main entry.

The ultimate analysis of a composite sample, made by combining face samples 79884 to 79886, is given under laboratory No. 79887.

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MONTEREY. PEACOCK MINE

Analyses 79869 to 79872 (p. 42). Bituminous coal from Peacock mine, a drift mine 1,825 feet above sea level, 7 miles east of Monterey, Putnam County, on the Tennessee Railway. Coal bed, Bon Air No. 2; thickness, 2 feet 6 inches to 2 feet 9¼ inches; flat. Roof, shale; floor, hard fire clay. Cover at points of sampling, 100 feet. The bed was measured and sampled at three points on May 18, 1921, by J. J. Forbes, as described below.

Sections of coal bed in Peacock mine

Section	A	B	C
Laboratory No.	79869	79870	79871
Roof, shale:	*Ft. in.*	*Ft. in.*	*Ft. in.*
Coal, with small "sulphur" bands	2 6	2 8	
Coal			2 3½
"Sulphur" band			¼
Coal			5½
Floor, hard fire clay:			
Thickness of bed	2 6	2 8	2 9¼
Thickness of sample	2 6	2 8	2 9¼

Section A (sample 79869) was measured at face of 3 right entry; section B (sample 79870) was measured at face of main entry; and section C (sample 79871) was measured at face of 4 right entry.

The ultimate analysis of a composite sample, made by combining face samples 79869 to 79871, is given under laboratory No. 79872.

System of mining, room and pillar. The coal was shot off the solid with FF black blasting powder. At the time of sampling the daily output was 100 tons, all from advance workings. All coal is run of mine. Coal is picked in mine and on cars. Output in 1920 was 1,400 tons. At time of sampling the life of the mine was estimated to be 125 years.

ROANE COUNTY

DE ARMOND. WILCOX MINE

Analysis 32754 (p. 44). Bituminous coal from Wilcox wagon mine at De Armond on the Southern Railway. Coal bed, Rockwood; thickness of bed, coal, and sample, 4 feet ½ inch. Roof, sandstone; floor, hard clay. Cover at point of sampling, 250 to 300 feet. The bed was measured and sampled on August 18, 1919, by L. C. Glenn for the Tennessee Geological Survey. This section was measured at head of west entry, 1,400 feet southwest of opening.

At time of sampling the daily output was 50 tons.

EMORY GAP. EMORY GAP MINE

Analysis 32752 (p. 44). Bituminous coal from Emory Gap mine, one-half mile north of Emory Gap on the Tennessee Central Railroad and the Southern Railway. Coal bed, Rockwood; thickness of bed, coal, and sample, 4 feet. Roof, sandstone; floor, hard clay. Cover at point of sampling, 200 feet. The bed was measured and sampled on August 18, 1919, by L. C. Glenn for the Tennessee Geological Survey. This section was measured at head of west entry, 400 feet from opening.

At time of sampling the daily output was a maximum of 25 tons.

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HARRIMAN. BLIZZARD MINE

Analysis 32753 (p. 44). Bituminous coal from Blizzard wagon mine, 3 miles east of Harriman on the Southern Railway. Coal bed, Rockwood; thickness of bed, coal, and sample, 3¼ feet. Roof, shale, 6 inches through sandstone; floor, hard clay. Cover at point of sampling, 250 feet. The bed was measured and sampled on August 18, 1919, by L. C. Glenn for the Tennessee Geological Survey. This section was measured at head of west entry, 600 feet west of opening.

At time of sampling the daily output of the mine was 25 to 50 tons.

SCOTT COUNTY

HELENWOOD. HELENWOOD MINE

Analyses 32740 to 32742 (p. 45). Bituminous coal from Helenwood mine one-half mile east of Helenwood on the Southern Railway. Coal bed, Glen Mary; thickness, 3 feet 2 inches to 3 feet 3 inches. Roof, gray tough shale; floor, soft clay. Cover at points of sampling, 150 feet. The bed was measured and sampled at two points on August 16, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below:

Sections of coal bed in Helenwood mine

Section	A	B
Laboratory No.	32740	32741
Roof, gray tough shale:		
Coal	Ft. 1 in. 2	Ft. 1 in. 4
Bone	*5	*3
Coal	1 9	1 8
Floor, soft clay:		
Thickness of bed	3 2	3 3
Thickness of sample	2 11	3 0

* Not included in sample.

Section A (sample 32740) was measured at head of 1 right on 1 entry, 400 feet east of opening; section B (sample 32741) was measured at head of main entry, 1 main entry, 450 feet east of opening.

The ultimate analysis of a composite sample, made by combining face samples 32740 and 32741, is given under laboratory No. 32742.

At time of sampling the daily output of the mine was 50 tons.

HELENWOOD. WAGON MINE

Analysis 32749 (p. 45). Bituminous coal from wagon mine (I. C. Stonecipher, operator) 1 mile north of Helenwood on the Southern Railway. Coal bed, Glen Mary; thickness of bed, coal, and sample, 26 inches. Roof, dark, thin-bedded shale; floor, soft clay. Cover at point of sampling, 100 feet. This bed was measured and sampled on August 16, 1919, by L. C. Glenn for the Tennessee Geological Survey. This section was measured at head of main entry, 250 feet west of opening.

At time of sampling the daily output was 10 tons.

HELENWOOD. FLAT CREEK MINE

Analysis 32750 (p. 45). Bituminous coal from Flat Creek mine, a strip mine, 3 miles east of Helenwood on the Southern Railway. Coal bed, Glen Mary; thickness of bed, coal, and sample, 3 feet 4 inches. Roof, sandstone; floor, soft

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fire clay. Cover at point of stripping, 6 to 10 feet. The bed was measured and sampled on August 16, 1919, by L. C. Glenn for the Tennessee Geological Survey. This section was measured in center of stripped area.

At time of sampling the daily output was 25 tons.

NEWLAND. ARCH MOUNTAIN NO. 2 MINE

Analyses 32795 to 32797 (p. 46). Bituminous coal from Arch Mountain No. 2 mine at Newland on the Tennessee Railroad. Coal bed, Big Mary; thickness, 2 feet 11 inches to 3 feet 11 inches. Roof, shale; floor, soft clay. Cover at points of sampling, 500 to 600 feet. The bed was measured and sampled at two points on August 21, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Sample 32795, representing 2 feet 11 inches of bed, was measured at 10 right room off 1 left entry, 1,600 feet west of opening; and sample 32796, representing 3 feet 11 inches of bed, was measured at 7 room off 1 left entry, 1,500 feet west of opening.

The ultimate analysis of a composite sample, made by combining face samples 32795 and 32796, is given under laboratory No. 32797.

At time of sampling the daily output was 125 tons.

NEWLAND. PEMBERTON & HIBBLE NO. 1 MINE

Analysis 32788 (p. 46). Bituminous coal from Pemberton & Hibble No. 1 mine at Newland on the Tennessee Railroad. Coal bed, Jellico; roof, sandy shale; floor, hard clay. Cover at point of sampling, 400 feet. The bed was measured and sampled on August 21, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Section of coal bed in Pemberton & Hibble No. 1 mine

Laboratory No.	32788
	Ft. *in.*
Roof, sandy shale:	
Coal	1 2
Clay	• 6
Coal	1 2
Floor, hard clay:	
Thickness of bed	2 10
Thickness of sample	2 4

• Not included in sample.

This section was measured at head of main entry, 700 feet west of opening.

At time of sampling the daily output was 25 to 50 tons.

ONEIDA. FOGAL OR OLD STANLEY NO. 5 MINE

Analyses 82649 to 82652 (p. 46). Bituminous coal from Fogal or Old Stanley No. 5 mine, opened about 1,200 feet above sea level, 3½ miles southeast of Oneida on the Tennessee Railroad. Coal bed, No. 4 or Paint Rock; practically level. Roof, good "slate"; floor, hard, rough and smooth, sandy shale. Cover at points of sampling, 60 to 75 feet. The bed was measured and sampled at three points by W. G. Forrester on October 28, 1921, as described on the following page.

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Sections of coal bed in Fogal or Old Stanley No. 5 mine

Section	A	B	C
Laboratory No.	82649	82650	82651
Roof, good "slate":	Ft. in.	Ft. in.	Ft. in.
Coal, hard lustrous	5		4¼
Coal		⅜	
Splint	1		
"Sulphur" band		⅛	
Shale, black			⅛
Coal, hard lustrous	6	3½	
Splint			2
"Mother coal"	½		
Splint or bony coal		1	
Coal, lustrous			5⅜
Coal, hard lustrous	8½		
Coal, lustrous		5½	
"Mother coal"		¼	¼
Coal, lustrous		10	8½
Floor, hard, rough and smooth, sandy shale:			
Thickness of bed	1 9	1 8¾	1 9
Thickness of sample	1 9	1 8¾	1 9

Section A (sample 82649) was measured at face of 1 left entry, 650 feet northeast of opening; section B (sample 82650) was measured at rib near face of main entry, 600 feet southeast of opening; and section C (sample 82651) was measured at rib at face of 1 right entry, 600 feet southeast of opening.

The ultimate analysis of a composite sample, made by combining face samples 82649 to 82651, is given under laboratory No. 82652.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder and 60 per cent dynamite. At time of sampling the daily output was 50 tons, 50 per cent from advance workings, but all was eventually to come from the advance. At the time of sampling the life of the mine was estimated to be 20 years.

ROBBINS. SOUTHERN CLAY NO. 5 MINE

Analysis 32751 (p. 46). Bituminous coal from Southern Clay No. 5 mine, at Robbins, 2,000 yards southeast of Southern Railway. Coal bed, Glen Mary; thickness, 2 feet 7½ inches. Roof, sandy shale; floor, soft clay. Cover at point of sampling, 150 feet. This section was measured and sampled on August 15, 1919, by L. C. Glenn for the Tennessee Geological Survey, as described below.

Section of coal bed in Southern Clay No. 5 mine

Laboratory No.	32751
Roof, sandy shale:	Ft. in.
Coal	6
Bone	• 7½
Coal	1 6
Floor, soft clay:	
Thickness of bed	2 7½
Thickness of sample	2

• Not included in sample.

This section was measured at head of main entry, 800 feet southeast of opening. At time of sampling the daily output was 25 tons.

SMOKEY. CHAMBERS MINE

Analyses 79921 to 79923 (p. 47). Bituminous coal from Chambers mine, a drift mine 1,700 feet above sea level, one-half mile south of Smokey on the Tennessee Railroad. Coal bed, State; thickness, 2 feet 4⅝ inches to 2 feet 5 inches; flat. Roof, sandstone; floor, "slate." Cover at points of sampling, approximately 75 feet. The bed was measured and sampled at two points on May 15, 1921, by J. J. Forbes, as described on the following page.

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Sections of coal bed in Chambers mine

Section Laboratory No.	A 79921	B 79922
Roof, sandstone:	*Ft. in.*	*Ft. in.*
Coal	1 2	11
Dirt parting	$\frac{3}{8}$	*1½
Coal	1 2	1 4½
Floor, "slate":		
Thickness of bed	2 4⅜	2 5
Thickness of sample	2 4⅜	2 3½

*Not included in sample.

Section A (sample 79921) was measured at right rib of main entry, 125 feet south of opening; and section B (sample 79922) was measured at face of 1 room, main entry.

The ultimate analysis of a composite sample, made by combining face samples 79921 and 79922, is given under laboratory No. 79923.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder. All coal was run of mine, derived from advance workings.

At time of sampling the life of the mine was estimated to be 25 years.

SMOKEY. WORKMAN & JEFFERS MINE

Analyses 79881 to 79883 (p. 47). Bituminous coal from Workman & Jeffers mine, a drift mine 1,800 feet above sea level, 1 mile south of Smokey on the Tennessee Railroad. Coal bed, State; thickness, 3 feet; flat. Roof, "slate"; floor, fairly smooth "slate." Cover at points of samplings, 100 feet. The bed was measured and sampled at two points on May 15, 1921, by J. J. Forbes, as described below.

Sections of coal bed in Workman & Jeffers mine

Section Laboratory No.	A 79881	B 79882
Roof, sandstone (immediate roof, "slate," 4 feet):	*Ft. in.*	*Ft. in.*
Coal	1	1
Dirt band	*¾	*¾
Coal	1 1½	1 1½
Shale	*1¼	*1¼
Coal	1 7½	1 7½
Floor, fairly smooth "slate":		
Thickness of bed	3 0	3 0
Thickness of sample	2 10	2 10

*Not included in sample.

Section A (sample 79881) was measured at right rib of main entry, 200 feet outby face; and section B (sample 79882) was measured at room 1 off main entry.

The ultimate analysis of a composite sample, made by combining face samples 79881 and 79882, is given under laboratory No. 79883.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder. Output in 1920 was 2,000 tons. The daily output of the mine is 25 tons. In 1921 the life of the mine was estimated to be 35 years.

SMOKEY. M'GILL BROTHERS' MINE

Analyses 79924 to 79926 (p. 47). McGill Brothers' mine, a drift mine 1½ miles southwest of Smokey on the Tennessee Railroad. Coal bed, State (?); thickness, 5 feet 5 inches; flat. Roof, shale. Cover at points of sampling, approximately 50 feet. The bed was measured and sampled at two points on May 14, 1921, by J. J. Forbes, as described on the following page.

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Sections of coal bed in McGill Brothers' mine

Section Laboratory No.	A 79924	B 79925
Roof, sandstone (immediate roof, shale, 3 feet 6 inches):	Ft. in.	Ft. in.
Coal	1	1
Dirt	•1	•1
Coal	1 0	1 0
Dirt	•1½	•1½
Coal	1 1½	1 1½
Floor:		
Thickness of bed	2 5	2 5
Thickness of sample	2 2½	2 2½

• Not included in sample.

Section A (sample 79924) was measured 75 feet outby face of main entry and at neck of room 1; and section B (sample 79925) was measured 50 feet from face of main entry.

The ultimate analysis of a composite sample, made by combining face samples 79924 and 79925, is given under laboratory No. 79926.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder. The daily output in 1921 was 25 tons, all from advance workings. All coal is run of mine. In 1921 the life of the mine was estimated to be 25 years

SMOKEY. HAYWOOD PROSPECT DRIFTS

Analyses 79877 to 79880 (p. 47). Bituminous coal from Haywood Coal & Lumber Co. prospects opened by drifts, 1¼ to 4 miles northwest of Smokey on the Tennessee Railroad. Coal bed, Upper Pioneer, Lower Pioneer (60 feet below Upper Pioneer), and Blue Gem (?) (50 feet above valley bottom); several other beds intervene between the Lower Pioneer and the Blue Gem. Beds lie flat. Roofs, shale and sandstone; floors, sandy shale, soft shale, and fairly hard fire clay. Cover at points of sampling, 15 to 50 feet. The beds were measured and sampled on May 14, 1921, by J. J. Forbes, as described below.

Sections of coal beds in prospect drifts

Section Laboratory No.	A 79877	B 79878	C 79879
Roof, shale and sandstone:	Ft. in.	Ft. in.	Ft. in.
Soft shale in contact with coal	•6		•1 0
"Draw slate"			1 11
Coal	3 6	7½	
Shale (parting)		•11	
"Rash"		•2	
Coal		2 9½	
Floor, sandy shale, soft shale, and fairly hard fire clay:			
Thickness of bed	4 0	4 6	2 11
Thickness of sample	3 6	3 5	1 11

• Not included in sample.

Section A (sample 79877), Lower Pioneer bed, was measured at face of prospect, 15 feet from opening; section B (sample 79878), Upper Pioneer bed, was measured at face of prospect, 15 feet from opening; section C (sample 79879), Blue Gem (?) bed, was measured at face of prospect, 25 feet from opening.

The ultimate analysis of a composite sample, made by combining face samples 79877 to 79879, is given under laboratory No. 79880.

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STANLEY JUNCTION. MORNING GLORY MINE

Analysis 32791 (p. 48). Bituminous coal from Morning Glory mine, near Stanley Junction, on the Tennessee Railroad. Coal bed, Paint Rock; thickness of bed, coal, and sample, 24 inches. Roof, gray, sandy shale; floor, hard clay. Cover at point of sampling, 150 feet. The bed was measured and sampled on August 20, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was measured at face, 500 feet north of mouth. At time of sampling the daily output was 150 tons.

STANLEY JUNCTION. PAINT ROCK MINE

Analysis 32790 (p. 48). Bituminous coal from Paint Rock mine, 1,000 feet south of Stanley Junction on the Tennessee Railroad. Coal bed, Paint Rock; thickness of bed, coal, and sample, 24 inches. Roof, sandy shale; floor, hard clay. Cover at point of sampling, 200 feet. The bed was measured and sampled on August 20, 1919, by L. C. Glenn for the Tennessee Geological Survey. This section was measured at head of main entry, 500 feet southeast of opening.

At time of sampling the daily output was up to 50 tons.

STANLEY JUNCTION. SEXTON MINE

Analyses 32792 to 32794 (p. 47). Bituminous coal from Sexton mine, near Stanley Junction, on the Tennessee Railroad. Coal bed, Paint Rock; thickness, 2 feet to 2 feet 2 inches. Roof, sandy shale; floor, hard clay. Cover at points of sampling, 150 to 200 feet. The bed was measured and sampled at two points on August 20, 1919, by L. C. Glenn for the Tennessee Geological Survey.

Sample 32792, representing 2 feet 2 inches of bed, was measured at head of 1 right cross entry, 600 feet northwest of opening; and sample 32793, representing 2 feet of bed, was measured at head of 1 left cross entry, 500 feet southwest of opening.

The ultimate analysis of a composite sample, made by combining face samples 32792 and 32793, is given under laboratory No. 32794.

At time of sampling the daily output was 100 tons.

STANLEY JUNCTION. TERRY-WEST NO. 5 MINE

Analysis 32787 (p. 48). Bituminous coal from Terry-West No. 5 mine, near Stanley Junction, on the Tennessee Rialroad. Coal bed, Paint Rock; thickness of bed, coal, and sample, 24 inches. Roof, gray shale; floor, hard underclay. Cover at point of sampling, 150 feet. The bed was measured and sampled on August 20, 1919, by L. C. Glenn for the Tennessee Geological Survey.

This section was sampled and measured at head of south entry, 1,000 feet east of opening.

At time of sampling the daily output was 50 to 75 tons.

WHITE COUNTY

CLIFTY. PILOT KNOB MINE

Analyses 80008 to 80011 (p. 49). Bituminous coal from Pilot Knob mine, a drift mine 1,640 feet above sea level, one-half mile southwest of Clifty on the Nashville, Chattanooga & St. Louis Railway. Coal bed, Pilot Knob; thickness, 3 feet 4 inches to 4 feet 9¼ inches; flat. Roof, soft "slate"; floor, hard and fairly hard "slate." Cover at points of sampling, 40 to 150 feet. The bed was measured and sampled at three points on May 23, 1921, by J. J. Forbes, as described on the following page.

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Sections of coal bed in Pilot Knob mine

Section Laboratory No	A 80008	B 80009	C 80010
Roof, soft "slate":	*Ft.* *in.*	*Ft.* *in.*	*Ft.* *in.*
Coal	3 4	4 3½	5
"Sulphur"			• ½
Coal			4 3½
Floor, hard and fairly hard "slate":			
Thickness of bed	3 4	4 3½	4 9½
Thickness of sample	3 4	4 3½	4 8½

• Not included in sample.

Section A (sample 80008) was measured at face of main entry; section B (sample 80009) was measured at face 1 right; and section C (sample 80010) was measured at face 1 left.

The ultimate analysis of a composite sample, made by combining face samples 80008 to 80010, is given under laboratory No. 80011.

System of mining, room and pillar. Coal was shot off the solid with FF black blasting powder and a permissible explosive. At the time of sampling the daily output was 200 tons, all from advance workings. All coal is run of mine. Output in 1920 was 4,863 tons.

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ANALYSES OF DELIVERED COAL

By N. H. Snyder[15]

Coal analyses help to describe the character of coal as it lies in the ground or as it is delivered to users. Analyses of samples of coal collected from the face of the bed in mines are plentiful, but available analyses of samples collected from coal as delivered to the consumer are relatively few. There is a distinct difference between "mine samples" and "delivered samples."

Mine samples are collected according to a standard method,[16] the essential features of which are a channel 2 by 6 or 3 by 4 inches cut from roof to floor in the face of the bed, and the exclusion from the sample of partings more than three-eighths inch thick and lenses or concretions of sulphur or other impurities more than 2 inches in maximum diameter and one-half inch thick.

Analyses of mine samples form a permanent or scientific record of the coal bed at the point sampled and are important in determining the character of the coal in any given mine or district. When the samples are taken in a standardized manner, these analyses are valuable to an operator for comparison with analyses of delivered coal, to show whether or not his mine is being efficiently worked or whether the coal is being properly prepared—which also involves the question whether he has suitable mechanical appliances for separating the impurities.

Mine samples may serve as reliable guides for the experienced purchaser who has knowledge of the impurities in the coal bed and the degree to which these are eliminated in mining and preparing the coal. To the average purchaser unacquainted with these details, however, dependence on mine samples may be misleading. The quality of coal indicated by the face samples can rarely, if ever, be attained in the delivered coal. Certain impurities that are eliminated from the formally prepared mine sample may not be eliminated by the miner interested in producing a large tonnage. Some of the roof and floor may also be included if these are soft or flaky. Some analyses of mine samples, particularly those taken from geological reports, may be from either outcrop coal or small workings not beyond the influence of weathering. When coal prices are high and competition is lessened it is easy for the miner and the management to lower the standards of preparation, and a return to rigid standards is always difficult.

[15] Engineer in charge, fuel inspection, Bureau of Mines.
[16] Holmes, J. A. The sampling of coal in the mine: Tech. Paper 1, Bureau of Mines, 1918, 22 pp.

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In sampling delivered coal the Bureau of Mines follows a definite procedure.[17] A sample of not less than 1,000 pounds is systematically collected by taking equal increments at regular intervals throughout the delivery, while coal is being loaded or unloaded. This sample is crushed and reduced by successive stages to laboratory size.

In using analyses of samples of delivered coal, it must be recognized that coal is not always of uniform size, and that the impurities are not uniformly distributed throughout the mass. Hence there will be some variation in the results of sampling; and even though the same mass of coal is sampled a number of times, the analyses would only agree absolutely by chance. Only when a large number of analyses representing a large tonnage mined over a long period are available, are the average value and range of variation of a particular coal known with certainty. With reasonable tolerances, however, for these variations, delivered coal can be sampled accurately enough for all practical purposes.

Delivered coal from any given mine may differ from day to day through variations in mining or preparing the coal; hence a record of analyses of delivered coal for any one time should not be considered a permanent record, for the output may be greatly improved by new methods of mining and preparation, or, may deteriorate through carelessness.

Table 3 gives the analyses of samples, collected by representatives of the various Government departments under direction of the Bureau of Mines from coal delivered to the Government, and by representatives of the Bureau of Mines from coal delivered to railroad cars at mine tipples. The former samples were collected systematically throughout the entire delivery; the latter samples were collected systematically throughout an entire day's run at the mine. These records of delivered coal indicate more nearly what the consumer is likely to receive, but the amount of coal represented and the number of analyses made must be carefully considered.

[17] Pope, G. S. Methods of sampling delivered coal and specifications for the purchase of coal for the Government: Bull. 116, Bureau of Mines, 1918, 64 pp. Directions for sampling coal for shipment or delivery: Tech. Paper 133, Bureau of Mines, 1917, 15 pp.

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TABLE 3.—*Analyses of*

Where mined			Size of coal	Approximate quantity delivered, tons
County and town	Mine	Bed		
1	2	3	4	5
Anderson County:				
Briceville	No. 1 and Volunteer	Coal Creek	Run of mine	200
Do	Cross Mountain	do	do	1,715
Coal Creek	No. 1	do	do	700
Windrock	Windrock No. 1	Windrock	do	650
Do	do	do	do	
Campbell County:				
Caryville	Bear Wallow No. 1	Coal Creek	do	300
Do	Bear Wallow	do	do	5,117
Do	do	do	do	5,040
Cotula	Cotula	Jellico	Lump over 6-in. round-hole screen.	50
Do	do	do	Run of mine through 6-in. round-hole screen.	150
Do	Wynn	Rich Mountain	Lump over 3-in. round-hole screen.	50
Do	do	do	Run of mine through 3-in. round-hole screen.	50
Gatliff	Regal	Regal Block	Run of mine	
Lafollette	Rex No. 1	Rex (Coal Creek)	Lump over 4-in. round-hole screen.	150
Do	do	do	Egg, 2¼ by 4 in. round-hole screen.	150
Do	do	do	Slack through 2¼-in. round-hole screen.	350
Red Ash	Indian Mountain	Jellico	Lump over 3-in. bar screen	150
Do	do	do	Run of mine through 3-in. bar screen.	150
Westbourne	Westbourne	Log Mountain	Run of mine	
Do	do	Log Mountain 48 per cent, Jellico 52 per cent.	Lump over 4½-in. round-hole screen.	300
Do	do	do	Run of mine through 4½-in. round-hole screen.	400
Claiborne County:				
Clairfield	King Mountain	Jellico	Run of mine	2,623
Eagan	Eagan	do	Lump over 6-in. round-hole and 5-in. bar screen.	250
Do	do	do	Run of mine through 6-in. round-hole and 5-in. bar screens.	500
Do	do	do	Run of mine through 6-in. screen.	1,362
Fork Ridge	Fork Ridge	Mason	Run of mine	1,350
Do	No. 2	Mingo	do	
Cumberland County:				
Ozone			Slack through 1¼-in. bar screen.	
Waldensia	Yellow Creek No. 1	Lower Sewanee	Run of mine	
Fentress County:				
Wilder	Fentress	Wilder	Lump over ¼ by 1 in. shaker screen.	
Grundy County:				
Coalmont	"B"	Middle Sewanee	Lump over ¾-in. screen	20
Do	do	do	Slack through ¾-in. screen	10
Do	do	do	Slack, washed	10
Palmer	Palmer	Sewanee	Run of mine	13,200

• Sample exposed to rain during collection and preparation.

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delivered coal

Proximate analysis, per cent					Calorific value per pound						Number of analyses averaged	Place of delivery	Date of delivery
	Dry coal				As received		Dry coal		Moisture free and ash free				
As received—Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	B. t. u.	Calories	B. t. u.	Calories	B. t. u.	Calories			
6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.7	36.0	55.5	8.5	1.3	13,640	7,578	13,880	7,711	15,170	8,428	1	Tipple	Dec., 1921.
2.2	36.3	55.3	8.4	1.2	13,610	7,561	13,920	7,733	15,200	8,444	7	U. S. Penitentiary, Atlanta, Ga.	1913–14.
1.6	35.6	54.7	9.7	1.2	13,430	7,461	13,650	7,583	15,120	8,400	1	Tipple	Dec., 1921.
2.0	35.7	54.6	9.7	.9	13,220	7,344	13,490	7,494	14,940	8,300	1	do	Sept., 1921.
6.4	34.5	55.3	10.2	1.1	12,580	6,989	13,440	7,467	14,970	8,317	1	St. Louis testing plant	1906.
1.8	36.8	55.5	7.7	.9	13,720	7,622	13,970	7,761	15,140	8,411	1	Tipple	July, 1921.
2.2	35.8	57.4	6.8	.9	13,800	7,667	14,110	7,839	15,140	8,411	10	U. S. Penitentiary, Atlanta, Ga.	1916–17.
2.0	36.4	56.1	7.5	.9	13,670	7,594	13,950	7,750	15,080	8,378	13	do	1914–15.
2.1	40.8	56.4	2.8	1.5	14,110	7,839	14,410	8,006	14,830	8,239	1	Tipple	July, 1921.
2.2	38.5	53.0	8.5	1.3	13,210	7,339	13,510	7,506	14,770	8,206	1	do	Do.
*3.4	39.8	57.7	2.5	.8	14,060	7,811	14,550	8,083	14,920	8,289	1	do	Do.
*4.5	38.2	52.7	9.1	1.0	12,850	7,139	13,460	7,478	14,810	8,228	1	do	Do
5.4	36.5	56.0	7.5	1.1	13,050	7,250	13,790	7,661	14,910	8,283	1	St. Louis testing plant	1906.
2.5	39.2	57.7	3.1	.9	14,220	7,900	14,580	8,100	15,050	8,361	1	Tipple	July, 1921
*2.7	39.1	56.1	4.8	.9	13,870	7,706	14,250	7,917	14,970	8,317	1	do	Do.
*3.3	34.2	49.6	16.2	1.1	11,990	6,661	12,400	6,889	14,800	8,222	1	do	Do.
3.3	40.5	56.0	3.5	1.1	13,860	7,700	14,330	7,961	14,850	8,250	1	do	Do.
3.2	36.4	55.0	8.6	1.0	12,980	7,211	13,410	7,450	14,670	8,150	1	do	Do.
5.1	37.7	55.1	7.2	1.0	13,300	7,389	14,010	7,783	15,100	8,389	1	St. Louis testing plant	1906.
2.4	39.6	56.2	4.2	1.1	14,000	7,778	14,340	7,967	14,970	8,317	1	Tipple	July, 1921.
2.5	37.7	54.5	7.8	1.2	13,390	7,439	13,730	7,628	14,890	8,272	1	do	Do.
2.0	35.4	50.9	13.7	2.0	12,670	7,039	12,930	7,183	14,980	8,322	7	Ft. Oglethorpe, Ga.	1913–14.
*4.6	39.3	58.1	2.6	.7	14,100	7,833	14,780	8,211	15,170	8,428	1	Tipple	July, 1921.
*4.3	38.0	57.1	4.9	1.0	13,710	7,617	14,330	7,961	15,070	8,372	1	do	Do.
3.0	37.2	53.4	9.4	1.4	13,230	7,350	13,640	7,578	15,060	8,367	4	U. S. Penitentiary, Atlanta, Ga.	1915–16.
2.0	37.3	54.2	8.5	1.5	13,350	7,417	13,620	7,567	14,890	8,272	1	Tipple	Aug., 1921.
4.8	34.6	53.7	11.7	1.7	12,580	6,989	13,210	7,339	14,960	8,311	1	St. Louis testing plant	1906.
3.5	21.5	49.6	28.9	.9	10,270	5,706	10,640	5,911	14,960	8,311	1	do	1906.
3.9	28.7	56.3	15.0	.8	12,510	6,950	13,020	7,233	15,320	8,511	1	do	1906.
3.0	36.0	50.7	13.3	3.4	12,610	7,006	13,000	7,222	14,990	8,328	1	do	1906.
3.9	28.3	57.0	14.7	1.0	12,510	6,950	13,020	7,233	15,260	8,478	1	do	1906.
5.7	26.9	53.4	19.7	.8	11,480	6,378	12,170	6,761	15,160	8,422	1	do	1906.
4.7	30.2	60.1	9.7	.7	13,160	7,311	13,810	7,672	15,200	8,494	1	do	1906.
5.2	28.6	58.8	12.6	1.0	12,540	6,967	13,230	7,350	15,140	8,411	70	Old Hickory Powder Plant, Jacksonville, Tenn.	1919–20.

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TABLE 3.—*Analyses of*

Where mined			Size of coal	Approximate quantity delivered, tons
County and town	Mine	Bed		
1	2	3	4	5
Marion County:				
Whitwell	Whitwell	Sewanee	Run of mine	2,846
Do	do	do	Lump over 1-in. round-hole screen.	8,[illegible]
Morgan County:				
Coalfield	Baker	Coal Creek	Run of mine	3,47[illegible]
Petros	Big Brushy	Brushy Mountain	do	75
Do	Big Brushy No. 1-2	do	do	
Scott County:				
Bear Creek Junction.	Wilson & Phillips	No. 4	Slack, washed	50
Oneida	Fogal or Stanley No. 5	No. 4 or Paint Rock	Run of mine	50
Sequatchie County:				
Dunlap	Dunlap	Sewanee	do	4,364
White County:				
Clifty	Clifty No. 1	do	Special run of mine over ¾-in. screen plus 8 per cent slack.	
Do	do	do	Special run of mine over ¾-in. screen plus 18 per cent slack.	

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delivered coal—Continued

Proximate analysis, per cent					Calorific value per pound						Number of analyses averaged	Place of delivery	Date of delivery
	Dry coal				As received		Dry coal		Moisture free and ash free				
As received—Moisture	Volatile matter	Fixed carbon	Ash	Sulphur	B. t. u.	Calories	B. t. u.	Calories	B. t. u.	Calories			
6	7	8	9	10	11	12	13	14	15	16	17	18	19
1.9	29.9	61.4	8.7	0.7	13,610	7,561	13,870	7,706	15,190	8,438	6	Ft. Oglethorpe, Ga	1915–16.
2.2	29.4	61.7	8.9	.7	13,520	7,511	13,820	7,678	15,170	8,428	20	Ft. McPherson, Ga	1919–20.
2.0	37.8	50.8	11.4	3.4	13,180	7,322	13,450	7,472	15,180	8,433	21	U. S. Penitentiary, Atlanta, Ga.	1913–14.
1.6	36.8	54.6	8.6	3.3	13,480	7,489	13,700	7,611	14,990	8,328	1	Tipple	Oct., 1921.
5.6	35.6	54.1	10.3	3.4	12,840	7,133	13,600	7,556	15,160	8,422	1	St. Louis testing plant	1906.
9.0	40.1	46.9	13.0	5.0	11,760	6,533	12,920	7,178	14,850	8,250	1	Railroad car at mine	Mar., 1915.
2.9	34.8	56.1	9.1	.7	13,240	7,356	13,640	7,578	15,010	8,339	1	Tipple	Oct., 1921.
2.1	31.0	58.9	10.1	1.3	13,460	7,478	13,750	7,639	15,290	8,494	39	U. S. Penitentiary, Atlanta, Ga.	1912–13.
2.6	34.4	51.8	13.8	4.5	12,720	7,067	13,060	7,256	15,150	8,417	1	St. Louis testing plant	1906.
3.1	34.0	51.4	14.6	4.9	12,520	6,956	12,920	7,178	15,130	8,406	1	do	1906.

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